THE IRON TRADE REVIEW

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Record Breaking Production of Steel Corporation

Continues and Independents Are Also Very Active—Pig Iron Buyers Show More Interest, But Place Few Orders

The production of the United States Steel Corporation continues at a record-breaking rate. The steel ingot output is over 60,000 tons daily, or at a rate of about 19,000,000 tons annually. Similar activity marks the operations of all the leading independent steel companies. General consumption throughout the country continues with little diminution, but buyers still hesitate, and furnaces and mills are depending almost entirely upon orders taken several months ago to maintain activity. This condition cannot continue much longer, for either the consumption must decrease or the buying must start in large volume. Developments of the past week have not been of a positive character, but are on the whole favorable. This is true particularly of the financial outlook, which is clearing.

Pig Iron

Numerous important melters of foundry grades have come into the market with inquiries and offers to buy round tonnages, but almost invariably, upon finding the market soft, have withdrawn. In some cases, where tonnages of good size have been offered to furnaces, and the views of buyers and sellers have not been far apart, it is expected that the inquiries will soon reappear. On a sale of 500 tons of Bessemer for delivery in June, to a buyer at Pittsburgh, the market declined 40 cents. In eastern territory, there has been a comfortable increase in new business, showing increasing disposition of consumers to buy at present prices. In the south, further weakness has developed, and as low as $11.25, Birmingham, can be done on No. 2, but increased interest is shown by buyers of southern iron. Shipments are now being made on about 10,000 tons of southern foundry iron to Hull, England, and an inquiry for 7,000 tons for export to southern Europe is pending.

Plates and Shapes

Several of the largest manufacturers of plates and structural material report an increase in specifications. While it is estimated that structural work pending amounts to 250,000 tons, many projects are being delayed on account of difficulty in financing. The most important projects are the Rock Island bridge at Memphis, calling for 30,000 tons; the Ohio river bridge of the Pennsylvania, at Louisville, 12,000 tons; the Kansas City terminal viaduct, 20,000 tons; the Baldwin Locomotive shops at Chicago, 8,000 to 10,000 tons; the government buildings at Washington, 8,000 to 10,000 tons; the Southern Aluminum building at Whitney, N. C., 8,000 tons; the American Zinc & Chemical building at Burgettstown, Pa., 8,000 tons. Bids have been received for 3,000 tons for the Indiana Steel Co.'s blast furnace work.

Sheet Bars

The Massillon Rolling Mill Co. has inquired for 48,000 tons of sheet bars to be delivered at the rate of 2,000 tons a month for the next two years. The Michigan Forge Co. is in the market for 5,000 tons of slabs. Efforts of buyers of sheet bars and billets to shade prevailing quotations have failed.

Nuts, Bolts and Rivets

A large volume of inquiry for nuts and bolts has developed in the Cleveland territory. One company is inquiring for 7,000,000 bolts and two or three others have inquired for from 2,500,000 to 3,000,000 bolts. The rivet market is weak and some very low quotations are being made. It is generally recognized that the price of rivets advanced too rapidly.

Bar Iron

The quotation on bar iron has declined to 1.50c, Chicago, or $1.50 per ton lower than the recent minimum quotation, and it is believed that further concessions have been obtained on desirable business. This condition seems to be peculiar to Chicago, and it has not affected other producers except when they come in contact with Chicago iron.

Railroad Buying

The placing of orders for about 10,000 cars, including 5,000 by the Erie, marks the best week for a long time in the car market. Rail orders are numerous, but small in tonnage, the largest being 15,000 tons for the Santa Fe, to be furnished by the Illinois Steel Co. The Grand Trunk has ordered 6,000 tons from the Carnegie Steel Co. for shipment from the Atlantic seaboard by water to Prince Rupert. Several other orders for a thousand tons each have been entered.

Chairman Gary Begins Testimony for Defense

Says He Did Legal Work in Forming Federal Steel—Farrell Concludes at New York Hearing

Judge E. H. Gary, chairman of the United States Steel Corporation, took the witness stand in the dissolution hearing at 3:30 o'clock Tuesday afternoon, after President J. A. Farrell and Thomas W. Joyce had completed their testimony. Spectators were getting ready to depart in expectation of adjournment for the day, when R. V. Lindabury, of counsel for the defense, quietly resumed his seat and called upon Judge Gary.

The chief executive officer of the Steel Corporation, who is expected to be the chief witness for the defense, arose smilingly from his seat at one side of the room and stepped over to the witness chair, where Special Master Henry P. Brown administered the oath. As the chairman sat down, the smile faded, giving place to a serious and somewhat somber expression, as though he realized fully the gravity of the suit which is to decide the fate of the great organization that he has piloted for 12 years, the suit in which he personally is a defendant. There was unusual silence in the room as Mr. Lindabury, in precise language, put the first question to the witness:

"Judge Gary, will you state your business connections and business career during the years you have been in business?'

"I am chairman of the board of directors, chairman of the finance committee and chief executive officer of the United States Steel Corporation," was Judge Gary's reply. Continuing, he said:

"I was born on a farm, worked on a farm, studied law, practiced law in Chicago a good many years, and finally became actively connected with the steel business at the time of the organization of the Federal Steel Co., when I was made president of that company."

"Had you had any previous business association with any steel industry?"

"Yes; I was general legal counsel of the Consolidated Steel & Wire Co. from the time of its organization in the early 90's, and finally I became a member of the board of directors of that company, which position I occupied until 1898. I was general counsel for the Illinois Steel Co. from about 1895 until the fall of 1898. I was a member of the board of directors of that company for a year or two years preceding the autumn of 1898. I became general counsel for the American Steel & Wire Co. of Illinois on its formation in the spring of 1898, but I did not follow it into the American Steel & Wire Co. of New Jersey, and had no connection with the latter. I was actively connected with the organization of the Federal Steel Co. and did most or nearly all of the legal work in connection with its promotion."

Here Judge Gary named the Illinois Steel Co., Minnesota Iron Co., Lorain Steel Co., and various railroads, steamship, coal and coke and other companies, that went into the Federal company at its organization. None of these was a competitor, he declared, except that the Lorain company had a girder rail mill and could manufacture standard steel rails, although not economically. It did manufacture standard rails to a small extent, but not enough to entitle it to be considered a competitor of the Illinois Steel Co.

Continuing, he said:

"Besides the legal work, I did most of the business part of organizing the Federal Steel Co. There was an authorized capital of $200,000,000, but the preferred and common stock issued amounted to nearly $100,000,000. The book value of the companies acquired was about $50,000,000, including $10,000,000 of net cash assets, and to that was added about $31,000,000 as the estimated actual value of the properties over and above their book

CHAIRMAN CHAS. M. SCHWAB, OF THE BETHLEHEM STEEL CORPORATION, TESTIFYING IN THE UNITED STATES STEEL CORPORATION DISSOLUTION SUIT

value, this estimate being, I think, low. About $14,000,000 of new capital was provided by a syndicate.

"The Illinois Steel Co. had been struggling along for a good many years without making much headway because of the lack of capital or manufacturing facilities, imperfect organization and other features. I have an impression it never paid any dividends. For a good many months preceding the summer of 1898 there was a good deal of discussion among the officers and directors of the Illinois Steel Co. concerning the desirability of securing additional properties and making improvements, and this was thought to be very necessary. In June of that year, a proposition was made by the stockholders of the Elgin, Joliet & Eastern railroad to sell to the Illinois Steel Co., and it was decided that this railroad could be utilized to advantage in carrying iron ore to the Joliet blast furnace plant, as well as in other connections.

How Negotiations Started

"I should say that the most influential men connected with the Illinois Steel Co. were Nathaniel Thayer, of Boston, and J. Forbes Leith, now Lord Leith, of New York. Marshall Field, of Chicago, was on the board but did not take much active interest in it.

"I received a letter from Mr. Thayer, of Boston, referring to the matter of the purchase of the Elgin, Joliet & Eastern railroad, and asking for an opinion in regard to it. I discussed the situation with the officers of the company and then wrote back to Mr. Thayer that we in Chicago thought the purchase of the roal without the acquisition of any other properties would not be so desirable; that we thought we should try to amalgamate with the Minnesota Iron Co. and the Lorain Steel Co., the latter having been offered for sale. That would give us a rounded-out plant, with iron ore reserves and ore roads and steamboats, steam coal and coking coal, manufacturing plants and transportation connections with trunk lines."

Adjournment was taken at this point until Wednesday morning.

Appointed Superintendent at Duluth

New York, May 28. (By wire.)—Samuel B. Sheldon, consulting engineer, Bethlehem, Pa., has been made general superintendent of the Minnesota Steel Co. He was for some years general superintendent of the Lackawanna Steel Co. and later superintendent of the Saucon plant at Bethlehem. Prior to that, he was connected with the Joliet works.

KIRBY HONORED

As He Retires From Presidency of Association of Manufacturers.

John Kirby Jr., of Dayton, retiring president of the National Association of Manufacturers, was presented a check for $10,000 by the delegates at the convention in Detroit last week. Resolutions adopted stated that the gift was "in recognition of his efficiency as president and his fearless battles against militant labor unionism, which have been as effectual as those of any other one man in the country in establishing the principle of the open shop."

The convention ended May 22 with

JOHN KIRBY JR.

the election of Col. George Pope, Pope Mfg. Co., Hartford, Conn., president. Other officers are:

Secretary, George S. Boudinot, New York.

Treasurer, Alonzo B. See, A. P. See Electric Elevator Co., New York.

General manager, J. Philip Bird, New York.

Scrap is Weak

Pittsburgh, May 28. (By wire.)—A prominent mill has bought 300 tons of heavy melting steel at $13, and another consumer has picked up a small tonnage at $13.25. Other grades are correspondingly weak and dealers are being asked to hold up shipments. The Pennsylvania railroad has sent out a new scrap list.

ARMOR PLATE PLANTS

Will Not Be Investigated at Once—Baltimore's Hopes.

Washington, May 28. (By wire.)—The senate committee on naval affairs, at a meeting this morning, decided to do nothing regarding the proposed investigation of the armor plate plants until Secretary Daniels reports on the resolution. Senator Tillman, chairman of the committee, introduced a resolution in the senate asking Secretary Daniels to inform the senate as to the cost to the government of the manufacture of armor plate and cost and time required to erect and equip a plant.

The chamber of commerce of Baltimore, through the mayor, has written the Maryland senators asking if government plant be built, it be located in Baltimore. The full committee comprises Senators Tillman, Thornton, Swanson, Bryan, Chas. F. Johnson, Chilton, Overman, John Walter Smith, Democrats, and Perkins, Penrose, Clapp, Lodge, William Alden Smith, and Page, Republicans; and Poindexter, Progressive.

WAGE CONFERENCE

Is in Progress at Detroit—Advance is Asked.

Detroit, May 27.—Conferences began today in the Hotel Pontchartrain between representatives of the steel rolling mills west of Pittsburgh, who are members of the Western Bar Iron Association, and representatives of the Amalgamated Association of Iron, Steel and Tin Workers. The latter are headed by President John Williams, and came to Detroit Monday from Fort Wayne, Ind., where the union convention was held last week. The men want a 12 per cent increase in wages.

Pittsburgh, May 28.—The Amalgamated Association of Iron, Steel and Tin Workers, after completing a conference with the Western Bar Iron Association, at Detroit, will have a further conference, Thursday, May 29, at Pittsburgh, with representatives of sheet and tin plate manufacturers. An advance of 50 cents above the present puddling scale is asked.

The Sons of Vulcan have appointed a wage committee to confer with manufacturers on wage questions. The dates for conferences have not yet been announced.

United States iron and steel works shipped $14,000,000 worth of iron and steel products to Argentina last year.

Pittsburgh Market More Optimistic

But There is Little New Buying—Price of Bessemer Pig Iron Declines on a Small Purchase

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, May 27.

Four important manufacturers advise that specifications this month are somewhat heavier than those the first 26 days of April, but little new buying is being experienced. As a consequence, mills are getting closer to consumers and premium prices for prompt delivery are rapidly disappearing. A more optimistic tone prevails in most branches of the trade.

Pig Iron.—The sale of 500 tons of June Bessemer to a local railway equipment company at about $16.60, valley, gives the first insight into the Bessemer situation for several weeks. The Westinghouse Electric & Mfg. Co. late today advised it had not closed negotiations for foundry requirements for shops at Cleveland and Pittsburgh, although frequent reports are heard that part of the iron has been obtained, and the Westinghouse Machine Co. has not yet bought all its second half foundry. The American Seeding Co., Springfield, O., which was in the market for several thousand tons, has withdrawn. None of the heavy melters are in the market, but an active buying movement is expected shortly. Since January 1, Bessemer has declined 25 cents, basic $1.75, foundry $3 and malleable $2.75 a ton, and it is not improbable a few stacks will go out unless conditions improve. It is believed that several quiet transactions will take place the next fortnight.

Ferro-Alloys.—Conditions have not improved, as is noted by a sale of 50 tons of ferro-manganese on Monday at $59.50, seaboard, although $61 is being asked on forward delivery. Other alloys are firm.

Plates.—Plates have settled to a range from 1.45c to 1.50c for both prompt and forward delivery. A sale of 3,000 tons for delivery the next two or three months was made last Saturday at 1.50c, indicating that conditions are stronger than credited in unofficial reports originating in the east, where talk of a 1.40c, quotation was heard a week ago. Deliveries are steadily improving although mills continue to be three, four and five months deferred.

Sheets.—Rumors of black sheets selling at 2.30c for No. 28 gage cannot be verified, although that figure does not seem out of the question. Galvanized products remain unchanged in price, but appear firmer. Specifications continue heavy and some mills are three and four months deferred in deliveries.

Tin Plate.—Specifications continue heavy and the prevailing $3.60 quotation is decidedly firm. No rumors of shading are heard.

Rails and Track Material.—Inquiries continue fairly heavy and mills are taking a large volume of orders for this time of year. Probabilities of heavy crops with increased freight revenues may lead railroads to increase normal purchases. Spikes and other track material remain unchanged.

Billets and Sheet Bars.—Sheet bar quotations adopted by THE IRON TRADE REVIEW last week represent the market accurately. Consumers are still trying to obtain material at lower figures, but have been unsuccessful. Billet prices are practically nominal owing to the fact that no sales have been made. Material continues scarce and indications point to but little improvement. Indefinite inquiries involve about 20,000 tons of sheet bars.

Hoops and Bands.—The Carnegie Steel Co. is rolling cotton ties for this year's crops but the price has not yet been fixed. Hoops and bands are being specified freely, but there is not much new buying.

Iron and Steel Bars.—Agricultural implement manufacturers have dropped out of the market, but it is generally believed they will supplement purchases made earlier in the year. Steel bars are firm at 1.40c and iron bars are held at 1.70c. Shafting is being sold at $2 a ton less than the prevailing market.

Muck Bar.—This product continues to sell at between $31 and $32, Pittsburgh.

Bolts, Nuts and Rivets.—Maximum quotations continue to be obtained on small tonnages, but attractive inquiries are bringing out decidedly lower figures. Rivets are selling about $1 or $2 a ton and bolts and nuts about 5 per cent less than prices adopted several months ago.

Structural Shapes.—Deliveries are gradually improving and consumers have not had to pay fancy prices for prompt material as was the case early in the year. Fabricating shops are well filled with orders, although no especially large inquiries are pending. Shapes are obtainable at from 1.45c to 1.50c.

Iron and Steel Pipe.—On May 27, the National Tube Co. advanced standard steel pipe one-half point or $1 a ton, and line pipe was similarly affected. Iron pipe and steel tubing and casing remain unchanged. The last previous advance was April 12, which was the same as the one effective today. No inquiries of importance are before the trade with the exception of one mentioned last week by THE IRON TRADE REVIEW.

Boiler Tubes.—Specifications continue to come in in good volume, but not much new buying is reported. No changes in quotations are noted.

Wire Products.—No improvement is noted and there is no snap in specifying or in buying. Prevailing prices have not been well established. Until jobbers' stocks are moved, no improvement is expected. Wire rods are nominally quoted at $30, Pittsburgh.

Coke.—Verification of the Pittsburgh Steel Co.'s purchase of about 30,000 tons a month for new stacks at Monessen was made today. It is understood the fuel involved was obtained at considerably less than $2.50, ovens, which figure nominally represented the market several months. The New Jersey Zinc Co. has not yet closed requirements for stacks at Hazard, Pa., and the Musconelcong Iron Works is figuring on fuel for shipment to Stanhope, N. J., the second half. Prompt furnace coke is selling at about $2.20, ovens. Demand for foundry fuel has not fallen off. Further talk of a labor shortage in the coke regions is heard. The Connellsville *Courier* for the week ending May 17, says production was 409,428 tons as against 414,486 tons the week before.

Old Material.—The market continues weak. Heavy melting steel is selling at $13.50 and other grades are correspondingly soft. No demand is being experienced and offerings are heavy.

Mount Hope Mine Strike Settled

New York, May 28. (By wire.)—The Mount Hope mine strike of the Empire Steel & Iron Co. has finally been adjusted by compromise. The men received a wage increase and a shorter day. The company does not recognize the union and retains loyal employes.

Bar Iron Declines in Chicago Market

Large Consumers of Pig Iron and Finished Materials Still Hesitate—Active Demand for Shapes from Warehouses

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, May 27.

During May new business in finished lines has fallen much below the April average and the volume of specifications received has exceeded shipments. Many large buyers, including agricultural implement makers, remain uncovered for their last half requirements and there is a general tendency on the part of consumers to hold off for the present. Business taken by the mills, however, is still sufficient to keep them operating at capacity for four or five months. The Republic Iron & Steel Co. is now willing to accept 1.50c, Chicago, on bar iron, a decline of $1.50 per ton in price. In shapes the demand from store is heavy, due to the large number of small jobs that are being placed.

Pig Iron.—The pig iron market is dull and bare of any material inquiries, those noted calling for prompt delivery on small tonnages. Sales have also been confined to tonnages of that character, most buyers being content to hold off. Jobbing foundries are still being kept out of the market owing to a lack of last half contracts.

The minimum quotation for northern iron is still based on $16, local furnaces, although that figure is considerably out of line with prices prevailing in the south. Southern iron can be had on a basis of $11.50, Birmingham, and it is seldom possible to place business at a higher figure although it is understood that some southern producers are adhering to the $12 basis. Pig iron consumers do not appear to be interested in future requirements at any price that has appeared thus far and their disposal to keep out of the market has been constantly strengthened by declines in quotations. Prices in this territory must be regarded as nominal to a great extent, owing to the marked scarcity of sales on which to base quotations.

Merchant Bars.—On bar iron the usual quotation is 1.50c, but concessions below that price are sometimes made. New business in both iron and steel bars is light as compared with the previous month and specifications are less than shipments.

Plates and Structurals.—This month has shown a marked falling off both in new business and in specifications and the total of structural contracts reported is lighter than for any week in many months, amounting to only 577 tons. Producers account for the scarcity in new business in these lines at present by the fact that most consumers are contracted far ahead for their requirements, the best mill delivery obtainable being, on the average, four to five months. Notwithstanding the scarcity of new business received by the mills the demand for small shapes out of store is exceedingly strong, due to the large number of fabricating jobs that are constantly coming up in the nature of apartments, small stores, store fronts and the like. In consequence, store prices are very firm at 2.05c, Chicago. The minimum for mill delivery on plates and shapes remains at 1.63c.

Railroad requirements continue to be small, pending developments in the freight rate situation.

Rails and Track Fastenings.—Railroads are light buyers in the present market but are specifying liberally against their contracts for both rails and track fastenings. Heavy rail requirements caused the total of specifications received by one local producer to be on a par with some of the largest weeks in the year. The Atchison, Topeka & Santa Fe has ordered 15,000 tons of rails from the Illinois Steel Co. No other rail business is in the market and conditions in track fastenings remain very quiet, there being hardly enough business to furnish an accurate gage on market quotations. Prices remain unchanged with the exception of spikes, which are quotable at from 1.80c to 1.90c, Chicago.

Bolts, Nuts and Rivets.—There is comparatively little change in this market and structurals continue weak and inactive as compared with a fair volume of business in bolts and nuts. The condition of the market for structural rivets is ascribed to overproduction, coupled with a lack of specific demand at this time.

Sheets.—The tone of the sheet market is as a whole much easier and many mills that have been somewhat congested are now in a position to quote on new business. Black sheets, however, are holding up much better than galvanized. Store business in sheets is less active than almost any other line, but jobbers are well satisfied at present. The demand from store has been sufficient to keep prices at their former level.

Wire Products.—This market continues comparatively quiet and prices are unchanged. Producers do not expect any great activity pending certainty as to crop conditions.

Merchant Pipe and Tubes.—Conditions are exactly similar to those in wire products.

Cast Iron Pipe. — No very large tonnages are pending. The city of Bloomington, Ill., is taking bids on about 700 tons of pipe, the contract for which has not been placed as yet. Reports of better conditions in the money market from day to day encourage makers to believe that some tonnages will come out before long.

Old Material.—The scrap market remains stagnant and as a result of low offerings on the part of dealers, further declines in price are noticeable. Under existing conditions a small amount of buying is detrimental to the market as it tends to bring quotations still lower, due to dealers' efforts to secure such business as can be obtained, and consumers are buying just enough to keep prices sagging and keep their stocks on hand at about the same level. Stocks in this territory are building up rapidly, as very little of the tonnage offered in recent railroad lists has been moved. The lists sent on during the past week were small, but coupled with light buying were sufficient to cause a general sag in quotations. The Elgin, Joliet & Eastern has invited bids on about 1,500 tons of miscellaneous scrap which were closed Monday, and the Rock Island has asked for offers of 3,440 tons. The Union Pacific has issued a list containing 2,500 tons and a small list has been sent out by the Grand Trunk.

Barge Launched.—The Vesta Coal Co., a subsidiary of the Jones & Laughlin Steel Co., Pittsburgh, launched its fifteenth 200-foot steel barge, May 27. The Jones & Laughlin company is building two barges a month approximately 10 months of the year for the Vesta company and will continue to do so until the fleet consists of about 100 barges. Although twice as long as typical coal barges used on the rivers in the Pittsburgh district, the Vesta company has found the larger type just as practical and much more satisfactory during the winter months. Each barge contains about 200 tons of steel.

Increased Inquiries at Cleveland Agencies

But Tonnage Placed is Small—Movement of Ore for May is Disappointing

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, May 27.

Iron Ore.—The movement of ore this month has been distinctly disappointing. Following the troubles due to the presence of ice, which continued until about 10 days ago, heavy rains at the head of the lakes interfered materially with operations during the past week, and it is probable that the movement will not be as heavy as it was in May of last year, when 5,919,074 tons were shipped. It is safe to predict, however, that the movement will exceed that of May, 1911, which was 3,684,819 tons. The delays of the past four weeks, and the unsatisfactory conditions of the pig iron market have caused a feeling of doubt in the minds of some observers as to whether a 50,000,000-ton record will be attained this year. Estimates of production by mining companies indicate, however, that 51,000,000 tons will be mined, and unless market conditions become much worse than they are, nearly all of this ore will be shipped. Ore is moving more freely from the mines this week than for a number of days, but is delayed in some places by shortage of cars. The shipping docks will work Memorial Day, but the men at lower lake ports will not be employed and a congestion of ships to be unloaded is expected. A big fleet will arrive by Friday night and some of the boats will probably be compelled to remain over Sunday. The new Pennsylvania ore dock in the outer harbor at Cleveland is doing rapid work. The steamer James M. Schoonmaker unloaded 11,825 tons of ore in five hours, Monday.

Pig Iron.—Some consumers of pig iron are showing a decided increase in interest and in a number of cases have made offers to buy large tonnages ranging from 2,000 to 4,000 tons. The uniform result, except in a very few cases in which less than 1,000 tons were purchased, has been the failure of the buyer to place his order. The difference between the offers made by some melters and those of the furnace operators has been, in some cases, only about 25 cents. Hence it is believed that a buying movement of fair proportion is not far distant. Many negotiations have been conducted very quietly. In the case of the Westinghouse Electric & Mfg. Co., a persistent rumor that at least a part of the tonnage had been placed is officially denied. An Ohio agricultural interest which was in the market for several thousand tons has withdrawn its inquiry.

Coke.—Buying of both foundry and furnace grades has been in small lots at current prices.

Finished Material. — On shapes, plates and bars, deliveries show little, if any, improvement and there is strong evidence of consumption continuing without diminution. Prices show little change, except that the paying of premiums for prompt shipment is constantly decreasing. Some mills report improvement in specifications as compared with last week. The leading companies report that cancellations are trifling and are entirely due to questions of delivery. Suspensions are also few and the usual reason given is that customers are able to get better delivery elsewhere. Collections show improvement. There is a good demand for specialties, such as steel wheels, piling and steel ties.

The Massillon Rolling Mill Co., Massillon, O., has put out an inquiry for 48,000 tons of sheet bars, 2,000 tons a month to be delivered over the next two years, on which it is seeking to make a sliding scale contract. A Michigan forge company is inquiring for 5,000 tons of slabs. Large inquiries for all sorts of bolts are coming out from automobile concerns, which are seeking to cover their requirements for the year following July 1. One such concern will need 7,000,000 bolts, two or three others will require 2,500,000 to 3,000,000 bolts, and others smaller quantities. The nut and bolt market has been inclined toward softness but the pending business has had a tendency to stiffen it.

Old Material.—The market continues very weak and dull. Practically all dealers in this district are out of the market for all varieties of scrap. There is a very large supply of machine shop turnings, and these are said to be actually going begging. The New York Central railroad closes a list on June 5. Heavy melting steel is still quoted at $11.75 to $12.25, although none of the large Cleveland consumers is doing any buying.

BRITISH MARKET

Is Abnormal—Heavy Buying of Pig Iron Expected.

London, May 27. (By cable.)—Cleveland warrants, 70s 9d, an increase of 3d.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birminham Eng., May 17.

Pig Iron.—The pig iron market continues in an entirely abnormal state, as the result of a strenuous fight over prices between the "bulls" and the "bears". The principal effect is that hardly any business is being done, and in all directions contracts are running out. The net result of the struggle is a gain of 1s 10d in price, as compared with a week ago. "Cornering" operations have been in full swing. It is estimated that during the last two weeks of February the "bears" parted with 100,000 tons of iron, and, since that time, prices have steadily risen. The recovery to 70s this week has been the quickest on record, and sufficiently demonstrates the strong state of the market. At the present time, there should be a large expansion of business and the outlook is quite hopeful now that the war in the east has come to an end. Yesterday's quotations were 70s ($17.14), but the artificial condition of the market is shown by the quotation of 61s 6d ($15.06) for three months' iron. Naturally, this disparity has been utilized for all it is worth, not only in Cleveland, but in other districts. It is recognized that a tremendous amount of buying must come along shortly, and this gives the holders of warrant stocks a great amount of confidence. The amount in store is now 228,000 tons. How far the present state of affairs will continue it would be risky to predict.

Finished Iron and Steel.—The market for finished iron and steel shows a little more inquiry. The most depressed department in the iron trade is that of common iron. The local manufacturers have been almost beaten out of the field by Belgian competition.

In the galvanized sheet trade, there are slight signs of recovery, but, so far, prices have been unaffected.

The steel trade continues very active, with a steady flow of orders. The billet trade, in particular, is good in spite of fairly large importations from the continent.

New Business at Philadelphia Increases

In Some Lines, But Market Lacks Tone—Pig Iron Prices Still Decline—Scrap is Weak

Office of THE IRON TRADE REVIEW,
611 Bulletin Bldg.,
Philadelphia, May 27.

General tone is lacking in the eastern Pennsylvania iron and steel market. While new business in finished lines has increased in some products, it is not moving freely. Pig iron is extremely sluggish and prices are being shaded without much difficulty. Scrap remains weak and dull.

Pig Iron.—Buyers remained out of the market except for small early lots and new business is practically stagnated. Prices still sag as makers show a willingness to shade freely, if the order is attractive. There is so little sizable business, however, that inside levels are a matter of conjecture. Consumers would have little trouble in doing $16.50, Philadelphia, for No. 2 northern on a round tonnage, but small lots are going 25 cents or more higher. Virginia iron, it is understood, is now available from some makers at $14, furnace, for No. 2, or 50 cents lower, equivalent to $16.80, Philadelphia. All makers will not do this, as some refused offers of $14.25, furnace, this week. The J. L. Mott Iron Works, Trenton, asks for 500 tons of No. 2 plain for third quarter. Pipe makers have bought some further tonnages of southern iron. Basic iron is nominal in price at the last sale, or at $16.50 delivery. The Standard Steel Works Co., which was reported inquiring for 3,500 tons of basic, merely sought price information, as it is not a consumer of this grade. This matter was not intended for an inquiry at all. Further sales of 1,000 tons to an eastern steel maker and smaller lots of standard low phosphorus have been done at $23.50, Philadelphia. One large buyer of this grade in this district is expected to close shortly. Inquiries for about 7,000 tons of southern iron for export to southern Europe are pending in the market.

Iron and Steel Bars.—Little new business is moving in steel bars and specifications are lighter. Some makers in the Pittsburgh district are offering to deliver certain smaller sizes in four to six weeks. Iron bars with eastern Pennsylvania makers are rather weak at 1.50c, mill, with new tonnage moderate. Shafting prices are being shaded one to two points, or to 60 and 54 off.

Plates.—Some contracts for third and fourth quarters have been closed by eastern Pennsylvania plate mills at 1.60c, Pittsburgh. Efforts of buyers to shade the price have been unsuccessful. The $1 differential for universal plates is still being quoted in some cases. Makers report the largest tonnage entered the past week in several weeks. European plate buyers who had asked prices of eastern mills on lots of 15,000 and 5,000 tons will probably get this material abroad.

Structural Material.—The tonnage going to eastern Pennsylvania shape mills is slightly better than a month ago, but is only fair. The mills are now rolling more of the smaller sizes which have been scarce. Eastern makers, including the Pencoyd plant, are offering quite prompt deliveries except on the smallest sizes at 1.45c, Pittsburgh. Mill stock orders on the largest and smallest shapes still command up to 1.70c and 1.75c, mill, for quick delivery. Structural lettings and offerings are small.

Sheets.—The Alan Wood Iron & Steel Co. has as large a tonnage of sheet business on its books as at any time in its history. Good buying for nearby delivery continues, but contracts are not numerous. Prices remain firm at 1.75c, Pittsburgh, for No. 10 gage.

Semi-Finished Material. — Consumers are drawing heavily upon their engagements of billets with eastern makers. Quick deliveries are generally wanted. Some negotiations of size are under way, though new forward business is not large. Prices are staple.

Old Material.—Brokers are furnishing most of the present demand for heavy melting steel, and they are able to buy at lower price where surplus stocks have to be moved. Sales of steel to brokers at $11.75, delivered, have been done. Large consumers are buying little material. Sales of No. 1 wrought at $14.75, delivered, and steel axles a trifle above $18, delivered, are noted. Iron rails, malleable and forge are lower.

METAL MARKETS

New York

May 26.

Copper.—Consumers of copper have been inclined to hold off buying during the past week. They are fairly well provided with stocks at present and see no reason for becoming more heavily committed while general business conditions appear to be at a stand-still if not really less active than heretofore. Although the large selling agencies have maintained their asking prices at 5.75c cash, New York, and 15.87½c delivered for electrolytic, other sellers have successfully offered the metal at ⅛c under those figures. The aggregate of copper available from outside sources is not large however, and there are no indications other than these cheaper lots, of weakness. Lake copper is offered at from 15.87½c to 16c, and casting at 15.37½c to 15.50c. The London standard market closed today at £68 11s 3d for spot and £68 3s 9d for three months.

Exports since May 1 are 33,964 tons.

Tin.—At the lower prices established for tin, consumers have shown more interest in the metal, and a fair amount of business resulted during the past week. Sales were made between 48c and 48.75c for spot and May metal, while June ranged about ¼c lower. The London market sold down to £218 5s for spot May 20, but since then more support has been manifested, and prices closed today about £4 higher. Spot closed at £222 10s and three months at £2 18s 5d. Arrivals since May 1 aggregate 2,947 tons, which is practically all the tin that will come in this month. There are 1,420 tons afloat.

Lead.—There has been more demand for lead during the past week and independent sellers are now asking close to 4.35c in New York for all positions up to the end of July. The American Smelting & Refining Co. continues to quote 4.35c for shipments to this territory.

Spelter.—Offerings at lower prices continue to come in the market which has been almost bare of demand. Prime Western can be bought at 5.40c in New York, in fairly large lots.

Antimony.—The situation is unchanged, sellers being more anxious to do business than buyers are and the market continues to sag. Cookson's is 8.87½c; Hallett's is 8.37½c and other brands 7.50c to 7.75c.

Chicago

May 26.

New Metals.—The market for new metals is easy and small declines in prices are noted. Spelter is lower, buyers covering for their weekly requirements at 5.30c, Chicago.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 15½c; casting 15⅜c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.30c; lead, desilverized, 4.15c; sheet zinc, $7.50, f. o. b. La Salle, in car lots of 600 pound casks; pig tin, 48.27c; Cookson's antimony, 8⅝c; other grades, 7½c.

Old Metals.—Business in old metals is falling off rapidly in spite of the fact that consumers have no material accumulation of stocks. The present situation is the reverse of that noted some weeks ago when old metals were out of line with new on account of active demand. At present the new metals market is the better of the two.

Southern Pig Iron Lower at Cincinnati

And Still the Extreme Dullness Continues—Southern Ohio Makers Refuse to Make Concessions

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, May 27.

Pig Iron.—A further decline in the price of southern iron has occurred within the past week, and southern No. 2 foundry is now being offered by two, and possibly three furnaces at $11.25, Birmingham basis, for any delivery this year. This iron is probably confined mostly to Tennessee furnaces, but it is rumored that one Alabama stack has also offered to take business at this figure. The general market quotations range from $11.25 to $12, Birmingham basis, with the majority holding at $11.50 as a medium. Several furnaces in both Tennessee and Alabama are still asking $12, Birmingham.

No change has apparently taken place in the southern Ohio district, where No. 2 foundry iron is still being held at $15, Ironton, for any delivery. This is attributed to the increase in the cost of manufacture during the past six months. Offers for business at $14.50, Ironton, are constantly being made and refused.

The general market is as dull, if not more so, than at any time for over a year. Sales are very few, and generally for small tonnages, while most of the inquiries are being sent out merely to feel the market. The Niles Tool Works, at Hamilton, O., is asking for 500 tons of southern foundry iron for the last half, and the Lunkenheimer Co., this city, is out for about 300 tons of the same grade. The inquiry of the Terre Haute (Ind.) Malleable Co. for 1,000 tons of malleable iron is still pending.

Coke.—The coke market is strong and prices are holding at about the same level as last week. Although there are a number of large inquiries for furnace coke in the market, there is no possibility that they will be closed soon, owing to the fact that furnaces have steadfastly refused to pay the prices asked by the ovens. On the other hand, the latter will make no concessions, declaring that they will let their ovens go out and sell their coal before they will agree to lower prices. The minimum quotations on practically all grades of coke from the Connellsville and Wise county districts do not represent those of all the producers as some are holding for higher figures on any business.

Finished Material.—Despite reports from outside districts that both black and galvanized sheets are being offered below the general market quotations, the local mill is holding firm at 3.40c for galvanized, and 2.35c for black sheets, both No. 28 gage, Pittsburgh basis. Specifications are coming in better than for the past ten days, and the mill is now about five weeks behind on deliveries.

Warehouse business is fair. Prices are stationary and are showing only moderate strength. Warehouse yards are pretty well stocked, and not experiencing much trouble in supplying the demand which was not the case several months ago.

Old Material.—The market is lifeless and apparently weak. Transactions are very few and dealers' yards are overstocked in comparison with the demand. Although there is hardly a general level of prices, as nothing has transpired recently upon which they could be based, it is probable that they have declined at least 25 cents a ton within the past few days.

More Business in Birmingham Market

And Decided Increase in Interest in Pig Iron—Fair Prices for Southern Delivery

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., May 27.

Pig Iron.—Decidedly more interest is being manifested by the trade generally than at the time of last report, and the volume of business transacted by local concerns in the past week is substantially larger than that of the week previous. The requirements placed have come largely from southern territory, and for that reason, the average price consideration for the week is probably higher than it would have been otherwise; at the same time, the buying to all appearances represents actual requirements, and as several lines of foundry trade is represented, the tone of the market is considered firmer. Of the transactions reported in the week, the most important involves 1,000 tons of No. 3 foundry, and 750 tons of No. 2 soft, which was entered for prompt shipment. In addition to this, a lot of 1,000 tons of analysis iron was entered for delivery in the next three months; 1,800 tons of high manganese was entered for the third quarter; 1,000 tons of gray forge was sold for delivery commencing immediately; an aggregate of 3,000 tons in lots of 500 to 750 tons each was entered for delivery through the third quarter, and some 1,500 to 2,000 tons in carload quantities were entered for spot shipment.

The prices paid for the tonnages entered range from $11.75 per ton at Birmingham for No. 2 foundry, to $13 per ton at Birmingham for the special analysis considerations. Carloads and 100 to 200-ton lots were entered at a strictly $12 basis in the majority of cases, but the larger requirements entered at the same price no doubt carried stipulations in the matter of analysis that would ordinarily mean a concession from the No. 2 foundry basis. It is understood, of course, that certain local brands are obtainable in competitive territory at $11.75 per ton, Birmingham, and even $11.50 per ton at Birmingham, but this tonnage has not increased. The same figures would no doubt apply to export tonnage of those brands that are quoted at higher figures in domestic territory, although such conditions usually obtain.

Cast Iron Pipe.—The output from local plants has been temporarily curtailed to some extent, due to a lack of orders for certain sizes, but no operations have been entirely suspended. Inquiry from all quarters of the trade indicates a larger volume of business to be placed in the future, although the immediate prospects consist of rather small requirements for prompt delivery. Prices as last revised are being adhered to without necessity for shading.

Old Material.—Consumers continue to provide requirements from time to time as necessary, and to be interested principally in bargain lots. Further decline in certain grades was noted in the week, but the nature of transactions recorded is such that a revision cannot be made with accuracy. With more inquiry coming forward for low grade pig iron, old material dealers are encouraged to a certain extent, but do not see clear to make substantial additions to stocks.

Pig Iron Buying Heavier in New York

Melters Showing More Inclination to Cover at Present Prices—Shipments of Southern Iron for Export

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg.,
New York, May 27.

Iron Ore.—Unloading of foreign iron ore cargoes at Philadelphia continues to be interfered with by the longshoremen's strike. A cargo of Wabana, Newfoundland, ore, after partially discharging, was obliged to put back on its return trip with 3,000 tons unloaded. If present conditions continue, many cargoes will, undoubtedly, be diverted to New York for discharging. Very little foreign ore now comes in at that port. The eastern furnaces have ample stocks and are not suffering from the delayed shipments.

Pig Iron.—Buying has been upon an increased scale in the metropolitan and New England districts the past week. Though the tonnage has not been large, it has reflected some change in the attitude of consumers and an appreciation that prices are getting down to very attractive levels for third quarter and last half. The Sessions Foundry Co., Bristol, Conn., purchased 3,000 tons of No. 3 for last half at about $16.50, delivered, dividing it between a Buffalo and a New York State maker. A New England buyer took 1,200 tons of charcoal. Another consumer in that district purchased 650 tons of No. 2X. A New Jersey soil pipe maker has closed against inquiries for 1,400 tons of No. 2X for its plant there and at Emporium, Pa. A New England buyer took 1,500 tons of No. 2X at $17.35, delivered, or $15, Central Pennsylvania. A Connecticut shop asks 1,000 tons of No. 2X for third quarter. An up-state railroad equipment maker is figuring upon a block of basic. A lot of 2,000 tons of low phosphorus is under negotiation. Makers are shading their openly announced prices where the order is attractive. It is apparent that $15, Buffalo, for No. 2X, is not the inside level. Virginia iron is reported to be available at $14, furnace, for No. 2X. Shipments are now going forward on a large lot of southern foundry iron, 10,000 tons or more, for Hull, England. The purchaser is understood to have been the American Radiator Co.

Ferro-Alloys.—Carload transactions represent the extent of the ferro-manganese market. Such sales at $60, seaboard, are noted. The $59 price recently made is less in evidence.

Plates.—The placing of 10,000 cars the past week broke the very dull market which has prevailed for some weeks. These inquiries have been pending for some time. New inquiries are coming out slowly. Eastern Pennsylvania plate makers continue firmly to hold their schedule to 1.60c, Pittsburgh, or 1.76c, New York, and are making some third and last half contracts at this basis. New tonnage, while a little better, is lighter than a month ago. Deliveries show improvement.

Structural Material.—New tonnage is only moderately active in this district. Lettings are not heavy and continue best on the railroad side. Much work is being planned in this district, but there appears to be more difficulty in financing. Subway work is again coming out. Fabricated competition is keen with prices ruling about $52 to $54, erected, for loft, and about $57 to $59, erected, for apartment work. Sizable orders continue to be taken by the eastern shape mills at 1.45c, Pittsburgh, or 1.61c, New York. Deliveries, generally, are more prompt.

Iron and Steel Bars.—Prompter deliveries are being offered on some sizes of steel bars by certain independent makers at the regular price of $14, Pittsburgh. New business is not active. Specifications are of smaller volume. Bar iron is irregular in price in this district and new business is lighter.

Cast Iron Pipe.—Private buyers are again inquiring more actively, but contracts are coming slowly. Public work is fairly active. Competition is sharp and prices irregular, especially on the larger sizes. R. D. Wood & Co. took 2,000 tons of 36-inch for Newark, N. J., at $20.74, delivered. The Donaldson Iron Works has 1,125 tons for Lowell, Mass., at $23.23. Schenectady, N. Y., takes bids, May 28, on 1,500 tons of 24-inch, and Pawtucket, R. I., June 4 on 285 tons of 6-inch.

Old Material.—An eastern Pennsylvania steel maker has purchased 1,000 tons of heavy steel at $12, delivered. This is now the full market, as sales to brokers have been made at $11.75, delivered. Dealers are offering but $9.50 to $9.70, New York, at most. Sales of borings at $8.50, delivered eastern Pennsylvania and sales of cast at $13 at interior Jersey points, are reported. The tone of the market is weak and buyers remain indifferent.

ST. LOUIS MARKET

Has Developed Inquiries for Car Load Lots Only.

Office of THE IRON TRADE REVIEW,
St. Louis, May 27.

Pig Iron.—The only inquiry is confined to a few car load lots for immediate shipment, although southern No. 2, is quoted as low as $11.75 to $12, and one small lot is reported to have been sold at $11.50, Birmingham, last week.

Coke.—The market for coke is even duller than it is for pig iron, with no change in prices.

Old Material.—With the exception of a considerable drop in the price of old steel rails and heavy melting steel, prices on scrap iron remained unchanged. The mills are running full, but there is practically no buying going on, and no lists are out today.

WIRE MILL

At Corey, Ala., Will Be Completed—Work Started.

Construction work on the wire mills of the American Steel & Wire Co., at Corey, Ala., has been started. Machinery stored at Farrell, Pa., is being prepared for shipment and work on employes' homes begun. The construction was stopped in April, 1911, after building operations had been well advanced.

The Birmingham, Ala., chamber of commerce recently petitioned the Steel Corporation on the subject, and the exchange of letters was never made public. Decision to complete the $3,000,000 plant followed conferences between Birmingham business men, Attorney General McReynolds, members of congress and Judge Gary.

Blast Furnace Closes Down

The Sheridan No. 2 blast furnace of the Berkshire Iron Works, Sheridan, Pa., has been closed down for an indefinite period, according to advices received from S. H. Chauvenet. Mr. Chauvenet also announces his resignation as manager of the company.

The Perry furnace of the Perry Iron Co., Erie, Pa., is out for relining.

The Norton Grinding Co., Worcester, Mass., recently completed a large cylindrical grinding machine for the National Tube Co., to be used at its Lorain, O., plant. The machine weighs 50 tons.

Pig Iron Prices Decline at Buffalo

But Melt Keeps Up Remarkably Well—Heavy Consumption of Finished Materials, But Little Buying

Office of THE IRON TRADE REVIEW,
Buffalo, May 27.

Pig Iron.—The absence of buying which has prevailed since last November has caused prices to float to a lower level around the $15 mark on foundry grades. This is only an approximate schedule, as the lack of trading leaves only an estimated basis upon which to gage the market. The furnaces of the district report that the buying done prior to Dec. 1 of last year was largely for first quarter requirement, and that the placements since the second quarter opened have been in piecemeal portions, because of the prevailing unsettled conditions. In the face of this situation, the melt has kept up remarkably well. Consumers are restricted by the unrest of labor and the attitude of their customers to await developments arising from the tariff changes. Three stacks in this territory are now out of blast and several more are likely to go out within a few weeks if there is not a resumption of a heavier volume of buying on a higher price base. There has been some trading in malleable, and a portion of this was placed at $16, but not of sufficient tonnage to hold the level above the schedule quoted.

Finished Material.—No increase in the demand is expected for the next two or three months. New business continues quiet and limited to sizes not covered by previous contracts. On bars, shapes and plates the mills and agencies of the district report that the material being insistently ordered out is going direct into consumption and that none of the users are stocking up. Specifications are up to monthly quotas and no cancellations are reported. Many of the mill customers report that they are very busy. It is figured that further favorable crop reports will influence the advent of a new buying movement early in the fall. The activity in structurals is confined to a great many building projects taking small tonnages, making a substantial total. An advance of ½ point on standard and line pipe became effective today. Prices remain fixed and firm on all of the finished material lines with the exception of black and galvanized sheets, in which the trading is active but at slightly softened prices.

Old Material.—Over half of the lines of scrap tumbled in prices during the week and it is figured that a still lower level is likely if the present inactivity continues. The principal user of heavy melting steel has again come into the market for material under contract, but this resumption of consumption has not been sufficient to keep the price from falling off 50c a ton. Car wheels took a similar drop, and varying declines took place in railroad malleable scrap, turnings, borings, boiler plate, sheared, locomotive grate bars and on both No. 1 and No. 2 busheling scrap.

Differ on Currency Reform Plans

Washington, May 27.—Reduction of the proportion of reserves which country banks shall be permitted to keep on deposit in reserve cities, proposed in the forthcoming currency legislation, is being opposed. Delay in introducing the bill in the house is attributed to this feature, a difference said to be existing between the president's advisers and Democratic leaders of the senate and house. Attorney General McReynolds favors keeping the bank reserves in the country banks, while Secretary of the Treasury McAdoo is said to take the position of New York and Chicago banks in opposing the limiting of the flow of money to Wall street. The currency bill will be completed this week and made public when the president sends his message to congress.

Awards Mill Extensions

Contracts for mill buildings recently placed with the McClintic Marshall Construction Co., by the Bethlehem Steel Co. cover the requirements for the new merchant mill capacity to be installed at South Bethlehem, Pa. The work includes buildings for the new merchant mills and for a 22-inch mill with yard runway, a blooming mill building, a pit furnace building, warehouse, pickling, annealing and cold drawing building, stripper building, locomotive repair shop and runways for the mold yard, billet yard and shipping yard. The Guerber Engineering Co., South Bethlehem, has the contract for a pattern storage building.

Charles M. Schwab, chairman of the Bethlehem Steel Corporation, sailed from New York, May 27, on an European trip.

TRENTON PLANT

Of American Bridge Co. May Be Enlarged—Inspection Made.

Trenton, N. J., May 27.—President August Cezzing, of Pittsburgh, and several of the directors and officials of the American Bridge Co. visited Trenton on Saturday, May 24, to make the annual inspection of the local plant and to discuss plans for the coming year. Accompanying Mr. Cezzing were R. J. Davis, general manager of the Bridge company's various subsidiary concerns; A. L. Dacis, trackage engineer, and several others who are members of the directorate of the company. They were entertained while here by Alfred C. Funk, general manager of the local plant.

The principal object of the conference was to arrange for the manufacture of 4,800 tons of steel to be used in connection with construction for supplying transmitting power along the Panama canal. The American Bridge Co. has secured this contract and the work is all to be done in the Trenton plant, to be completed by February 16, 1914. At the conference here, arrangements were completed for the installation of new equipment that will be needed.

The Bridge company officials are also giving considerable thought to the possibility of enlarging the Trenton plant to meet increased business demands that will follow the completion of the Delaware river channel from Philadelphia to Trenton.

One of the Trenton officials, when asked what would be done to keep pace with improved transportation facilities that will be afforded by the deeper channel, said that the company had been considering the project for months past. He stated that as soon as the river work is completed, the company would secure steel barges to transport its products to Philadelphia and New York. He also intimated that the corporation had arranged to increase its output by the erection of additions to its present plant, in case the Delaware proves to be a satisfactory route for transportation.

Samuel Gompers, president of the American Federation of Labor, is a patient at a sanitarium at Atlantic City, N. J. It was stated at the hospital Monday, that Mr. Gompers is suffering from a nervous breakdown and that he has improved in health since coming to the seashore.

Striking Machinists at Buffalo Returning

Employers Fighting for the Open Shop—Ford Motor Co. Dismantling Its Plant—Equipment Shipped to Detroit

Buffalo, May 27.—Buffalo has been selected as the place to test the strength of the International Machinists' Association. Recognition of the union and the 50-hour week instead of the 54-hour week, the closed shop, together with certain demands for increases in wages and abolition of piece and premium work are the major points involved in the machinists' strike now in progress In a score of shops, less than 1,000 machinists went out on strike, but in doing so they involved in all a total of over 3,000 employes, as the shop owners, practically all members of the Employers' Association of Buffalo, closed their plants for an indefinite period as soon as the strike of the machinists became apparent in their respective places of business.

"It is simply a question of the continuance of the open shop, insisted upon by the employers, as against the demands of the strikers that we operate as union shops," said William H. Barr, general manager of the Lumen Bearings Co., and president of the Employers' Association. "The association does not propose to yield this important point under any circumstances. The employers are united and will fight to the finish for the open shop or nothing.

"This association here is particularly strong. It is composed of practically all the leading foundries of the city, the machine shops, boiler shops, woodworking plants, employing tinsmiths, lithographers and printers, exclusive of the newspaper publishers and the employing contracting teamsters. It controls fully three-quarters of the teaming of the city.

"The fact that Buffalo has been known as an open-shop city is due largely to the work of the association, for it successfully fought the teamsters' strike in 1901, the iron molders' strike in 1906, the wood-workers' strike in 1911 and a number of other minor strikes.

"The association has always maintained the attitude of being fair with the men employed by its members, to treat with them for the purpose of correcting grievances. It has not discriminated against men because they happened to belong to a union, but it has and will refuse to treat with them as union men, or to deal with any one as the representative of a union upon any demands whatever. In other words, we propose to adhere to the open-shop principle.

"The men who have gone out want a 50-hour week, while we insist it will be 54 hours. They say recognize the union and we hold firm for the open shop. Some say they want better wages. We say that under the open shop methods here many of the men are getting even better than the union rates demand, because these men are worth it, and we propose to continue to pay the men on a basis of what they are worth. In the open shops here the machinists are getting from $2 to $5 a day."

Shops Involved

The shops involved in the strike are as follows:

The Ford Motor Co., which has been discontinued, its plant dismantled and the equipment shipped to the parent plant at Detroit, involving 450 men, 40 of whom were machinists; the Crosby Co., the Buffalo Gasolene Motor Co., the Niagara Machine & Tool Works, the H. G. Trout Co., Sterling Engine Co., the D. H. Stoll Co., the Augustine Automatic Rotary Engine Co., the Linde Air Products Co., the McCue Co., the Contractors' Plant Mfg. Co., the Automatic Transportation Co., the Olin Gas Engine Co., the Buffalo Pitts Co., the King Sewing Machine Co., the Ericsson Mfg. Co., the Taber Pump Co., the John E. Smith's Sons Co., and the Charles E. Hall Co., all of the employers' association, and the Buffalo Forge Co.

The men of the Crosby Co. went out on May 12 and made no demands until May 23. The 800 employes of this plant returned to work Monday under the conditions existing before the strike. There were about 150 machinists and specialists, 400 pressmen and the rest were helpers, welders and other employes. William H. Crosby, president of the plant, said the men returned without any concessions being made; that any grievances they have will be taken up with the men as individuals as rapidly as possible, and that all raises in pay will date from May 26, according to an agreement entered into between the company and a committee of the men. "This agreement was reached with the employes only," said Mr. Crosby. "The open shop will be maintained in the future as it has in the past. Last September the men were granted a 55-hour week in place of a 60 with no reduction of wages."

In addition to the men going back at the Crosby Co. under the open-shop plan the strikers decided to return to the plants of the H. G. Trout Co., the Buffalo Pitts Co., the John E. Smith's Sons Co. and the Charles E. Hall Co. To the latter its force of about 100 men returned, including 40 machinists. At the Buffalo Pitts Co. only a few of the younger men went out, the older hands preferring to remain. In each instance the open shop is to continue.

William H. Hill, of the Charles E. Hall Co., said that many, in fact most of the machinists have joined the union, but in coming back to work under the old conditions they are being treated with as individuals.

A. Niedermeyer, manager of the Snow Steam Pump Works, one of the largest plants of its kind in the country, said on May 23: "In view of the men of this company not going out it has been decided to cut the hours six less a week, from 60 to 54, and to advance the wages slightly so as to compensate the men for the fewer hours. The factory is to remain an open shop."

William Knudsen, general manager of the Ford Motor Co., said: "The work of dismantling the Ford plant here is going on. The machinery and part of the plant will be shipped to Detroit. There will be no branch of the big automobile company in this city in the future. Plans were about ready for the erection here of a large addition to the plant, but the attitude of the striking machinists has knocked all this in the head. We recently cut the hours from 60 to 54 a week with no reduction of wages, but in the face of the labor unrest which has developed, the plant here, with an annual payroll of $240,000 a year, will be discontinued."

The strike of the machinists is being conducted by Organizer Joseph Sonnabend, of the International Association of Machinists. The shops involved, where the men have not returned, are closed and picketed. Organizer Sonnabend declares: "Where the men are going back, they have gained what they asked. That is the only condition on which they would return."

In wages the strikers demand the following: Machinists, 37½ cents per hour; specialists, 30½; tool and die makers, 40; die sinkers, 60; machine shop helpers, 25 cents an hour, and on outside contract erecting work the minimum wage shall be $4.50 for 8 hours. All of the men receiving more than the minimum rate are not to suffer by the reduction of the working hours from 54 to 50 per week.

Many Buildings Are Being Planned

But it is Hard to Get the Money and Structural Contracts Placed Are Not Numerous—Tonnage Moderate

Structural lettings in the eastern market the past week have been moderate. The total has not exceeded 10,000 tons. Many apartment and loft buildings are being planned in New York City, but greater difficulty is being encountered in financing propositions. Subway work is again coming out in the metropolis. Fabricating work is being keenly competed for.

The most noticeable feature of the structural market in Chicago is the absence of large tonnages and the preponderance of small jobs calling for light shapes. The latter consist of apartment buildings, stores, store fronts and the like. Most of the material obtained for these jobs is obtained from store, causing a very active demand on the jobbers and indicating that while premiums for prompt mill delivery have largely disappeared, mills are still unable to make quick shipments. Fabricating prices are reported as being somewhat better, as the small jobs with which many shops are occupied furnish a better margin of profits. The total of the larger contracts reported during the past week is lighter than it has been for any week in many months, as it amounts to about 577 tons.

It is officially advised that a pipe line project at Winnipeg, Canada, mention of which already has been made, will involve 100 miles of 60-inch riveted steel pipe.

A 20-story hotel will be erected on the site of the German Evangelical Protestant Church, Smithfield street and Sixth avenue, Pittsburgh, according to plans announced this week by promoters. The Fort Pitt Hotel Co. is understood to be back of the proposition. A heavy tonnage would be involved.

The Seattle Construction & Dry Dock Co. was low bidder on one of the two government tenders for service on the Pacific ocean. In the neighborhood of 3,000 tons are involved.

CONTRACTS PLACED

Technical High School, Toronto, Canada, 2,000 tons to Dominion Bridge Co.

Filter building, American Sugar Refining Co., Brooklyn, 500 tons to A. E. Norton & Co.

Office building, Hartford Electric Light Co., Hartford, Conn., 700 tons, to Levering & Gerrigues.

Apartment for Fabian Construction Co., East Twenty-eighth street, New York City, 700 tons to Passaic Structural Steel Co.

First National Bank building, Appleton, Wis.; 100 tons, Dornell & Kunert.

Extension of plant of General Electric Co., Lynn, Mass., 500 tons to the American Bridge Co.

State Capitol building, Salt Lake City, Utah; 136 tons, Minneapolis Steel & Machinery Co.

Temple Israel, Chicago; 203 tons, South Halsted Street Iron Works.

Self-supporting stack, Penn Traction Co, Pittsburgh; 135 tons, the Riter-Conley Mfg. Co.

Ten story distillation building, Solvay Process Co., Detroit, 2,100 tons, the Riter-Conley Mfg. Co.

Extension to the cutter room at the mill, New York & Pennsylvania Co., Johnsonburg, Pa.; 500 tons, the Jones & Laughlin Steel Co.

Plant addition, American Brewing Co., Rochester, N. Y., 100 tons, George Kellogg Structural Co.

City Hall, Tonawanda, N. Y., 100 tons, Buffalo Structural Steel Co.

Public school No. 24, Rochester, N. Y., 100 tons, Jones & Laughlin Steel Co.

PENDING STRUCTURAL WORK

New plant for the Southern Aluminum Co. at Whitney, N. C., 8,000 tons.

Market building and plaza, Newark, N. J., 1,600 tons. Bethlehem sections. Bids taken.

Erecting shop, E. W. Bliss Co., Brooklyn, 600 tons. Taking bids.

Dominion Bank, Toronto, Canada, 2,000 tons. General contract awarded to James Stewart & Co.

Royal Bank Hotel, Toronto, 3,000 tons. Now active.

Section No. 4 of Broadway Fourth avenue subway, New York City, 4,150 tons. Bids go in June 24.

Addition to Arcade building, Philadelphia, 1,300 tons. Irwin & Leighton low on general contract. Fabrication expected to go to American Bridge Co.

Filtration plant, Baltimore, 1,000 tons of reinforcing bars. Low bid of Keystone Construction Co. rejected.

Filtration plant, New York City, 900 tons reinforcing bars. Low bid Keystone Construction Co. rejected.

Exchange office building for Southern Bell Telephone & Telegraph Co., Memphis, Tenn., 500 tons. Bids asked.

ERIE PURCHASE

Breaks Dullness in Car Market—Other Orders Placed.

New York, May 28. (By wire.)—Rail orders are numerous, but small in tonnage. The Grand Trunk places 6,000 tons with the Carnegie Steel Co. for shipment from the Atlantic seaboard by water to Prince Rupert. The Pennsylvania Southern has ordered 1,000 tons from the Carnegie Steel Co. The Pittsburgh & Shawmut has also ordered 1,000 from the same company. Small lots give the Carnegie Steel Co. 5,000 and the Illinois Steel Co. 3,000 in the week.

Dullness which has characterized the car market for some weeks was broken by the purchase by the Erie railroad of 5,000 cars. Railroads also continue to furnish most of the tonnage going to eastern structural mills. At Chicago, railroads are light buyers, but are still the source of some new business, the Santa Fe having placed 15,000 tons of rails with the Illinois Steel Co. and some fair car orders being noted. The market for track fastenings is easy, spikes being quotable from 1.80c to 1.90c, Chicago.

Delivery has been started on the locomotive order of the Pennsylvania lines west, by the American Locomotive Co. Two were delivered last week and others will follow until the completion of the order, which was for 140 locomotives, as noted several months ago. All are equipped with the Crawford underfeed stoker and are practically smokeless.

CAR AND LOCOMOTIVE ORDERS.

The Erie Railroad, 5,000 cars, of which 1,500 box, 500 gondolas and 500 hoppers went to the Standard Steel Car Co., 500 box to the American Car & Foundry Co. and 1,000 hoppers to the Pressed Steel Car Co.

Hocking Valley Railroad, 1,000 gondolas to the Ralston Steel Car Co.

International Great Northern Railroad, 10 oil burning consolidation freight locomotives to the American Locomotive Co.

Chesapeake & Ohio, 2,000 hoppers to Standard Steel Car Co.

Lehigh Valley Railroad, 2,000 cars, of which 1,000 gondolas go to the Standard Steel Car Co., 1,000 box to the Pullman Co.

Great Northern Railroad, 29 wooden and steel baggage coaches, mail and combination mail and baggage cars to the American Car & Foundry Co.

The Bethlehem Steel Co. is inquiring for 50 hopper cars.

The Pennsylvania Steel Co. has taken 400 tons of girder rails for Yonkers, N. Y.

BRIDGE WORK

Delaware, Lackawanna & Western Railroad, 10 bridges, 2,200 tons to the American Bridge Co.

Pennsylvania railroad, 700 to 800 tons. Bids asked.

New York Central Railroad inquiry issued for four additional bridges, 520 tons.

The American Bridge Co. has taken 138 tons from the Chicago Great Western Railway Co. for three 60-foot through plate girder spans near Durango, Ia.

CAR INQUIRIES

The Lehigh Valley railroad is in the market for 2,000 box and hopper cars.

RAIL ORDERS

United Traction Co., Albany, 500 tons girder rails to Pennsylvania Steel Co.

The operations of the Algoma Steel Co., Sault Ste. Marie, Ont., in March were the most favorable ever reported.

SPECIFICATIONS

And Other Subjects to be Discussed By Testing Society.

The sixteenth annual meeting of the American Society for Testing Materials, will be held at the Hotel Traymore, Atlantic City, N. J., June 24 to 28. The provisional program includes the following reports and papers:

Tuesday, June 24, 11 a. m.

Report of Committee A-3: On Standard Specifications for Cast Iron and Finished Castings. Walter Wood, chairman.

Report of Committee D-5: On Standard Specifications for Coal. J. A. Holmes, chairman.

Report of Committee E-6: On Papers. Edgar Marburg, chairman.

Tuesday, June 24, 3 p. m. On Preservative Coatings

Report of Committee A-5: On the Corrosion of Iron and Steel. Allerton S. Cushman, chairman.

Tests on the Rate of Corrosion of Metals. A. W. Carpenter.

Report of Committee D-1: On Preservative Coatings for Structural Materials. Percy H. Walker, chairman.

Report of Committee D-2: On Standard Tests for Lubricants. A. H. Gill, chairman.

Tuesday, June 24, 8 p. m.

Annual address by the president.

Report of Committee A-4: On Heat Treatment of Iron and Steel. Henry M. Howe, chairman.

The Influence of Mass in the Heat Treatment of Steel. K. W. Zimmerschied.

Effect of Size of Section on the Physical Properties Developed by Heat Treatment. J. H. Nead.

Conservation and Shipping Containers. B. W. Dunn.

Wednesday, June 25, 10 a. m. On Steel.

Report on Tests Made on Rail-Steel Concrete Reinforcement Bars under the Direction of Sub-Committee V of Committee A-1. W. K. Hatt.

Report of Committee A-1: On Standard Specifications for Steel. William R. Webster, chairman.

Rail Failures and Their Causes. M. H. Wickhorst.

The Resistance of Steels to Wear in Relation to Their Hardness and Tensile Properties. George L. Norris.

The Effect of Small Percentages of Vanadium on the Physical Properties of Steels. George L. Norris.

Wednesday, June 25, 8 p. m. On Steel and Wrought Iron.

Report of Committee A-2: On Standard Specifications for Wrought Iron. S. V. Hunnings, chairman.

Report of Committee A-8: On Standard Specifications for Cold-Drawn Steel. C. E. Skinner, chairman.

Oxygen in Iron and Steel: Value of Ledebur Method in its Determination. W. R. Fleming.

Results of Tests of Welded Boiler Tubes. E. L. Lasier.

A Magnetic Criterion of the Mechanical Properties of a One Per Cent Carbon Steel. Charles W. Burrows.

Results of Mechanical Tests on Heat-Treated Spring Steel. R. P. Devries.

Friday, June 27, 3 p. m. On Non-Ferrous Metals.

Report of Committee B-1: On Standard Specifications for Copper Wire. J. A. Capp, chairman.

Report of Committee B-2: On Non-Ferrous Metals and Alloys. William Campbell, chairman.

Metallographic Study of Lead-Tin-Antimony Alloys. William Campbell.

The Strength of Cast-Zinc Spelter. George C. Stone.

A Study of Bearing Metals and Methods of Testing. T. D. Lynch.

High-Tensile Bronzes with Special Reference to Tensilite. C. R. Spare.

Saturday, June 28, 10 a. m. On Testing Apparatus and Methods.

Report of Committee E-1: On Standard Methods of Testing. Gaetano Lanza, chairman.

Report of Committee A-10: On Hardness Tests. D. E. Douty, chairman.

Spherical Bearings. Mont Schuyler.

A Repeated Stress Testing Machine. J. B. Kommers.

The Use of the Strain Gage in the Testing of Materials. W. A. Slater and H. F. Moore.

Large Capacity Testing Machines in this Country and Europe. E. L. Lasier.

RATE INCREASE

Depends Upon Additional Facts—Physical Valuation.

Washington, May 26.—Final action by the Interstate Commerce Commission on the petition of eastern railroads for a 5 per cent rate increase will depend upon the nature of additional information the commission has asked. Announcement is expected to be made in a few days regarding the eastern roads' application.

Conferences, which will probably last a month, were begun today between railroad presidents and members of the commission to determine the physical valuation of railroads, authorized at the last session of congress for use in connection with rate making. The commission hopes at the end of these conferences to clear its calendar for the summer recess.

Considering Increase in Rates

Washington, May 28. (By wire.)—Railroad heads and the Interstate Commerce Commission are continuing the discussion of preliminary plans for physical valuation of railroads. The question of a 5 per cent increase by eastern roads is also up. An unverified report is that the commission looks with favor upon an increase.

Talked About Sundry Civil Bill

Washington, May 28. (By wire.)—President Wilson conferred yesterday with Senator Martin and Representative Fitzgerald, chairman of the congressional committee on appropriations, regarding the sundry civil bill. Senator Martin said he had no intimation that the president would veto the bill.

DISTRICT COURT

Agrees With Labor Unions in Asking Review of Decision.

Washington, May 27.—For the first time in the District of Columbia and perhaps in the entire country, an inferior court has objected to the Supreme Court of the United States of the treatment given by a tribunal vested with power to hear and determine appeals from the judgments and decree of the inferior court. A petition signed by Chief Justice Clabaugh and Associate Justices Barnard, Anderson, Gould, Wright, and Stafford, of the Supreme Court of the District of Columbia, was filed yesterday with the Supreme Court of the United States, asking that the latter reverse that portion of the decision of the Court of Appeals of the District of Columbia reducing the sentences of Samuel Gompers, John Mitchell and Frank Morrison. Gompers' sentence was reduced from 12 months to 30 days in jail and Mitchell and Morrison were assesed a fine of $500 each and the jail sentences previously imposed were eliminated. The Supreme Court of the District of Columbia concurs in the request of the labor leaders of last Saturday asking a review by the United States Supreme Court.

Presidents Not Meddling in Roosevelt's Case

The attention of Elbert H. Gary, chairman of the United States Steel Corporation, was called to the intimations which have gone out to the effect that the defense in the libel suits brought by Col. Roosevelt against the editor of the *Iron Ore*, of Ishpeming, Mich., had received indirect support and encouragement from the heads of certain subsidiary companies of the United States Steel Corporation. These Steel officials, according to published statements, have by innuendo furnished some of the gossip reflecting on Col. Roosevelt's personal habits.

Judge Gary today disposed of the matter in the following statement:

"I am sure that none of the presidents of our subsidiary companies ever made or had any ground for making such charges. I have personally known Col. Roosevelt for many years and feel certain that no person of serious mind will attach importance to such loose or irresponsible insinuations."

The E. W. Bliss Co., Plymouth and Jay streets, Brooklyn, manufacturers of presses and heavy machinery, is taking bids for a new erecting shop, which will be 130 x 200 feet in dimensions.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH

(Through Third Quarter.)

Bessemer	$17.50
Basic	15.65
No. 2 foundry	15.40
Malleable	15.40
Gray forge	14.90

The freight rate from valley points is 90c.

CLEVELAND

(Through this Year Delivered in City.)

No. 1 foundry	$15.75 to 16.00
No. 2 foundry	15.25 to 15.50
No. 2 southern	15.60 to 16.10
Bessemer	17.50
Silveries 8 per cent silicon	20.55

CINCINNATI

(Through This Year.)

Southern foundry No. 1	$15.00 to 15.50
Southern foundry No. 2	14.50 to 15.00
Southern foundry No. 3	14.00 to 14.50
Southern foundry No. 4	13.75 to 14.25
Southern gray forge	13.50 to 14.00
Mottled	13.50 to 13.75
Southern No. 1 soft	15.00 to 15.50
Southern No. 2 soft	14.50 to 15.00
Standard southern car wheel	27.25 to 27.75
Southern Ohio No. 2	16.20 to 16.70
Southern No. 3	15.70 to 16.20
Southern Ohio No. 4	15.45 to 15.95
Silveries 8 per cent silicon	19.70 to 20.20

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.)

Lake Superior charcoal	$18.00 to 19.25
Northern foundry No. 2	16.00 to 16.50
Southern foundry No. 2	15.85 to 16.35
Jackson co. silveries, 8 per cent	21.40
South'n silveries, 5 per cent sil.	18.35
Alabama basic	17.85
Malleable	16.00 to 16.50

PHILADELPHIA

(Prompt and second quarter shipment delivered to consumer's plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$16.75 to 17.00
Northern No. 2X foundry	16.50 to 17.00
Northern No. 2 plain	16.25 to 16.50
Standard forge (Eastern Pa.)	15.75 to 16.00
Virginia No. 2X	16.80 to 17.30
Southern No. 2	16.25 to 16.50
Standard low phos., Phila	23.50
Malleable	17.75 to 18.00
Basic (Eastern & Central Pa.)	16.50

NEW YORK

(Prompt and second quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	$16.75 to 17.00
Northern No. 2X foundry	16.50 to 17.00
Northern No. 2 plain	16.25 to 16.50
Virginia No. 2X	16.80 to 17.30
Southern No. 2	16.50 to 17.00
Malleable	16.75 to 17.00
Gray forge	16.00 to 16.25

ST. LOUIS

(Throughout this year.)

Southern No. 1	$15.50 to 16.00
Southern No. 2	15.00 to 15.75
Southern No. 3	14.50 to 15.00
Southern No. 4	14.25 to 14.75

(Freight, Birmingham to St. Louis, $3.75)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	$12.50
No. 2 foundry	12.00
No. 3 foundry	11.50
No. 4 foundry	11.00 to 11.50
Gray forge	10.75 to 11.25
Mottled	10.50 to 11.00
Standard basic	12.00 to 12.50
Off basic	11.00 to 11.50
Charcoal	25.00 to 25.50

BUFFALO

(Through this year, delivered in city.)

No. 1 foundry	$15.00 to 15.75
No. 2X foundry	14.75 to 15.00
No. 2 plain	14.75
No. 3 foundry	14.50
Gray forge	14.50
Malleable	15.25 to 15.75
Basic	16.00 to 16.50
Charcoal	16.50 to 17.50

Ferro Alloys

English 80 per cent ferro-manganese, $59 to $61, seaboard, early and forward.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $26. Eleven to 12 per cent, $25. Ten to 11 per cent, $24. Nine to 10 per cent, $23, f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown, $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 and 30 cents higher respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
St. Louis	22½ cents
Denver	84½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents
Pacific coast, sheets, No. 11 and heavier	80 cents
Pacific coast, sheets, Nos. 12 to 16	85 cents
Pacific coast, sheets, No. 16 and lighter	95 cents
Pacific coast, wrought pipe and boiler tubes	65 cents

Coke

AT THE OVENS.

Connellsville district:	Prompt shipment.	Contract.
Foundry coke	$2.85 to 3.25	$3.00 to 3.25
Furnace coke	2.00 to 2.25	2.25 to 2.50
Wise county district:—		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.15 to 2.50	2.25 to 2.50
Pocahontas district:—		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.25 to 2.50	2.50
New River district:—		
Foundry coke	$3.25 to 4.00	$3.25 to 4.00
Furnace coke	2.50 to 2.60	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania, furnace points range from 35 to 75 cents per ton.

Billets and Sheet Bars

PITTSBURGH

For prompt and forward delivery, Bessemer 4 x 4 billets with 0.25 carbon and less, $26.50 to $27.00; open-hearth rolling billets, $26.50 to $27.50; Bessemer sheet and tin bars, $27.50; open-hearth sheet bars, $27.50, f. o. b. Pittsburgh and Youngstown. Forging billets, $35, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: 4 x 4-inch open-hearth and Bessemer rolling billets at $28 to $30, and forging billets at from $35 to $36.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.45c to 1.50c. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.63c to 1.68c.

PHILADELPHIA

Delivered to consumers in Philadelphia and vicinity. Standard structural shapes from Eastern Pennsylvania mills on contract 1.60c to 1.65c; for prompt delivery, 1.60c to 1.70c. From Pittsburgh mills 1.60c.

NEW YORK

Standard structural shapes for second quarter delivered at New York by eastern Pennsylvania makers 1.61c to 1.66c. On third quarter and last half contracts, Pittsburgh district makers are quoting from 1.61c to 1.66c, New York.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¼ to 100 inches, 1.45c to 1.50c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inch thick, 6⅝ to 100 inches wide, 1.63c to 1.68c.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity. Tank plates from eastern Pennsylvania mills for prompt or contract delivery 1.75c; universal plates 1.75c to 1.80c. From Pittsburgh mills, tank and universal plates 1.60c to 1.65c.

NEW YORK

Steel plates, tank quality, for second quarter delivery at New York by eastern Pennsylvania makers, 1.76c. On small lots of universal plates $1 extra asked by some makers; on third quarter and last half contracts,

Pittsburgh makers are quoting 1.61c to 1.66c, New York.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	2.35c
No. 28, tin mill black	2.30c
No. 28, galvanized	3.40c to 3.50c
No. 10 blue annealed	1.75c
Painted corrugated	2.55c
Galvanized corrugated	3.55c
Tin plate, 100 pound cokes	$3.60

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.90c.

Pipe and Boiler Tubes

PITTSBURGH

	Black. Butt.	Galv. Weld.
Steel ¾ to 3 inches	79	70½
Iron, ¾ to 2½ inches	73	62
BOILER TUBES.		
Steel, 3½ to 4½ inches	70	..
Iron, 3½ to 4½ inches	58	..

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.34c for open-hearth; carload lots less than 500 tons 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, base, Pittsburgh; track bolts, 2.40c to 2.50c, base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.80c.

CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $22 to $23; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.80c to 1.90c; smaller size spikes, 2.05c, base; track bolts with square nuts, 2.30c to 2.40c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.70c to 1.80c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops in carload lots, 1.60c, Pittsburgh, in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 and 58 per cent off in carloads and 55 and 53 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron 1.50c to 1.57½c; hard steel bars rerolled, 1.65c to 1.75c; soft steel bars, bands and small shapes, 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars 1.55c to 1.60c on contract and common bar iron, 1.55c to 1.60c. Prompt steel bars on mill shipments, 1.85c to 1.90c, delivered. Cut nails 1.90c to 1.95c, Philadelphia. Shafting 60 and 58 and 55 and 53 off in base territory.

NEW YORK

Delivered in New York, steel bars on contract from 1.56c to 1.61c, and common iron bars, 1.52c to 1.60c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 2.15c to 2.20c, Pittsburgh, cone head boiler rivets, 2.25c to 2.30c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 2.08c to 2.18c; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within a 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 75 and 10; cut threads 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10, and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅜-inch and larger, $6.60 off; ½-inch and smaller, $7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.80, retailers' carload lots, $1.85, cut nails (western makers), jobbers' lots, $1.70; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 40c for galvanizing; plain wire to jobbers in carloads, $1.60; and to dealers in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.20.

CHICAGO

Wire nails, jobbers' carload lots, $1.93 to $1.98; retailers' carload lots, $1.98 to $2.05; retailers' less than carload lots, $2.03 to $2.08; painted barb wire, jobbers' carload lots, $1.93 to $1.98; retailers' carload lots, $2 to $2.05; retailers' less than carload lots, $2.03 to $2.08, with 40c for galvanizing; plain wire, jobbers, carload lots, $1.73; retailers' carload lots, $1.78.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $28; 6 to 12 inches, $27; larger sizes, $25; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $25, f. o. b. New York, in carload lots.

BIRMINGHAM

Water main: 4-in., $22.50; 6-in. and up, $20.50. Gas main: $1 per ton higher than water main. Special fittings, $45 to $47.50.

Old Material

PITTSBURGH

Gross tons delivered.

Heavy melting scrap	$13.50
Rerolling rails	15.00 to 15.25
Malleable	12.50 to 13.00
Agricultural malleable	12.00 to 12.50
Bundled sheet scrap	10.00 to 10.50
Iron axles	25.50 to 26.00
Old iron rails	15.00 to 15.50
Stove plate	10.00 to 10.25
No. 1 wrought scrap	15.00 to 15.25
Old car wheels	14.50 to 14.75
Low phosphorus	16.00 to 16.25
Machine shop turnings	7.00 to 7.50
No. 1 busheling	12.75 to 13.00
Cast borings	9.00 to 9.50
No. 1 cast scrap	14.25 to 14.50

PHILADELPHIA

Gross tons delivered to consumers' plants in eastern Pennsylvania and western New Jersey:

Old iron rails	$17.00 to 17.50
Old steel rails (rerolling)	15.00 to 15.50
No. 1 heavy melting steel	11.75 to 12.25
Old car wheels	13.50 to 14.00
Old iron axles (nominal)	26.00 to 27.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	14.50 to 15.00
Wrought pipe	12.00 to 12.50
Cast borings	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
Heavy cast (broken)	13.25 to 13.75
Malleable	12.00 to 12.50
Stove plate	10.00 to 10.50
No. 1 forge	10.00 to 11.00
Low phosphorus	16.25 to 16.75

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$15.50 to 16.50
Old steel rails (under 3 ft.)	13.50 to 14.00
Old steel rails (over 6 ft.)	13.50 to 14.00
Relaying rails	23.00 to 25.00
Old steel boiler plate	10.00 to 10.50
Malleable iron (railroad)	13.00 to 13.50
Axle turnings	9.00 to 9.50
Steel axles	19.50 to 20.00
Malleable iron (agricultural)	10.50 to 11.00
Heavy steel	11.75 to 12.25
Country mixed steel	10.00 to 10.50
Bundled sheet scrap	8.50 to 9.00

Net Tons

No. 1 R. R. wrought	$12.00 to 12.50
No. 1 busheling	10.25 to 11.00
No. 1 machine cast	11.50 to 12.00
No. 1 dealers' wrought	9.50 to 10.00
Machine shop turnings	4.50 to 4.75
Pipes and flues	8.00 to 8.50
Wrought drillings	4.50 to 4.75
Cast borings	6.50 to 7.00
Stove plate	7.75 to 8.25
Wrought iron arch bars	16.00 to 16.50
Wrought iron piling plate	15.00

CHICAGO

(Delivered in consumers' yards.)

Gross Tons.

Old car wheels	$14.00 to 14.50
Old iron rails	15.50 to 16.00
Rerolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and und.)	11.75 to 12.25
Frogs, switches and guards	10.75 to 11.25
Heavy melting steel	10.75 to 11.25
Shoveling steel	10.50 to 11.50

Net Tons.

No. 1 R. R. wrought	$10.75 to 11.25
No. 2 R. R. wrought	10.25 to 10.75
Arch bars and transoms	14.75 to 15.25
Knuckles, couplers and springs	11.25 to 11.75
Shafting	15.00 to 15.50
Iron car axles	20.75 to 21.25
Steel car axles	17.25 to 17.75
Locomotive tires	12.00 to 12.50
Dealers' forge	10.00 to 10.50
Pipe and flues	8.00 to 8.50
No. 1 cast	11.25 to 11.75
No. 1 busheling	9.00 to 9.50
No. 2 busheling	8.75 to 9.25
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.00 to 12.50
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	5.50 to 6.00
Railroad malleable	12.00 to 12.50
Agricultural malleable	10.50 to 11.00
Angle bars, splices, etc., iron	14.50 to 15.00
Angle bars, steel	10.50 to 11.00
Stove plate and light cast scrap	9.50 to 10.00

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for Eastern Pennsylvania delivery:

Old car wheels	$11.50 to 12.00
Steel axles	15.75 to 16.00
Old steel shafting	14.25 to 14.50
No. 1 heavy melting steel	9.50 to 9.75
No. 1 R. R. wrought	12.75 to 13.00
Wrought pipe (not galvanized)	9.50 to 9.75
Cast borings	6.25 to 6.50
Machine shop turnings	6.50 to 6.75
Heavy cast	11.25 to 11.50

Stove plate	$7.50 to 8.00
Grate bars	7.25 to 7.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

CINCINNATI

Gross Tons.

Old iron rails	$12.25 to 12.75
Old steel re-rolling	10.75 to 11.25
Old iron axles	16.75 to 17.25
Heavy melting scrap	10.25 to 10.75
Relaying rails	19.50 to 20.00
Bundled sheet scrap	7.00 to 7.50

Net Tons.

Old No. 1 R. R. wrought	$9.75 to 10.25
No. 1 yard wrought	7.50 to 8.00
No. 1 machine cast	10.00 to 10.50
No. 1 busheling	8.25 to 8.75
Stove plate	7.75 to 8.25
Machine shop turnings	5.75 to 6.25
Cast borings	5.50 to 6.00
Heavy turnings	6.00 to 6.50
Mixed cast	8.50 to 9.00
Breakage	6.25 to 6.75
Malleable	7.75 to 8.25

BIRMINGHAM

Old iron axles, (light)	$15.00 to 15.50
Old steel axles, (light)	15.00 to 15.50
Old iron rails	13.50 to 14.00
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Tram car wheels	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Light cast and stove plate	8.50 to 9.00

BUFFALO

Heavy melting steel	$11.50 to 12.00
No. 1 R. R. wrought scrap	14.00 to 14.50
No. 1 R. R. and mch. cast scrap	13.75 to 14.25
Old steel axles	17.50 to 18.00
Car wheels	14.50 to 15.00
Railroad malleable scrap	12.50 to 12.75
Wr'ght iron and soft steel turn.	6.00 to 6.50
Cast iron borings	7.50 to 8.00
Low phos. steel scrap	17.00 to 17.50
Old iron rails	15.00 to 15.50
Boiler plate, sheared	13.50 to 14.50
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	10.00 to 10.50
No. 1 busheling scrap	10.50 to 11.00
No. 2 busheling scrap	8.00 to 8.50

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$13.50 to 14.00
Old iron rails	13.00 to 13.50
Rerolling rails (5 ft. and over)	13.25 to 13.50
Old steel rails (3 ft. and under)	11.00 to 11.50
Light sec. relayers (45 pounds and under) subject to inspec.	23.50 to 24.50
Relaying rails, subject to inspec.	23.50 to 24.50
Frogs, switches and guards	11.25 to 11.50
Heavy melting steel	10.75 to 11.25
Shoveling steel	9.25 to 9.75

Net Tons

No. 1 railroad wrought	$11.00 to 11.50
No. 2 railroad wrought	10.50 to 11.00
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers, springs	10.00 to 10.50
Shafting	13.50 to 14.00
Steel car axles	17.50 to 18.00
Iron car axles	21.00 to 21.50
Locomotive tires	11.00 to 11.50
Pipe and flues	6.50 to 7.00
Tank iron and cut boilers	6.50 to 7.00
No. 1 cut busheling	9.50 to 10.00
No. 2 cut busheling	7.50 to 7.75
Cast and mixed borings	6.25 to 6.75
Machine shop turnings	7.25 to 7.75
Railroad malleable	10.50 to 11.00
Agricultural, malleable	9.00 to 9.50
Stove plates	8.00 to 8.25
Angle splice bars (iron)	12.50 to 13.00
Angle splice bars (steel)	11.00 to 11.25

Store Prices

CINCINNATI

Steel bars, 2.10c; iron bars, 2c; plates and shapes, 2.20c; sheets, blue annealed No. 10, 2.40c; black, No. 28, 2.85c; galvanized, No. 28, 3.95c; cold rolled shafting, round, square, hexagon and flat, 50 off.

CLEVELAND

Steel bars, 2.10c; plates and shapes, 2.25c; iron bars, 2.05c; sheets, No. 10 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.95c; iron bars, 1.95c; hoops, 2.50c; shapes and plates, 2.05c; No. 10 blue annealed sheets, 2.25c; black, No. 28, 2.90c; galvanized, No. 28, 4.15c.

PHILADELPHIA

Steel bars 2.05c to 2.10c; structural shapes, 2.00c to 2.10c; plates, 2.00c to 2.10c.

NEW YORK

Steel bars, 2.05c; structural shapes, 2.15c; plates, 2.15c.

PRESIDENT'S ATTACK

On Lobbyists—Foreign Nations Object to Tariff Provisions.

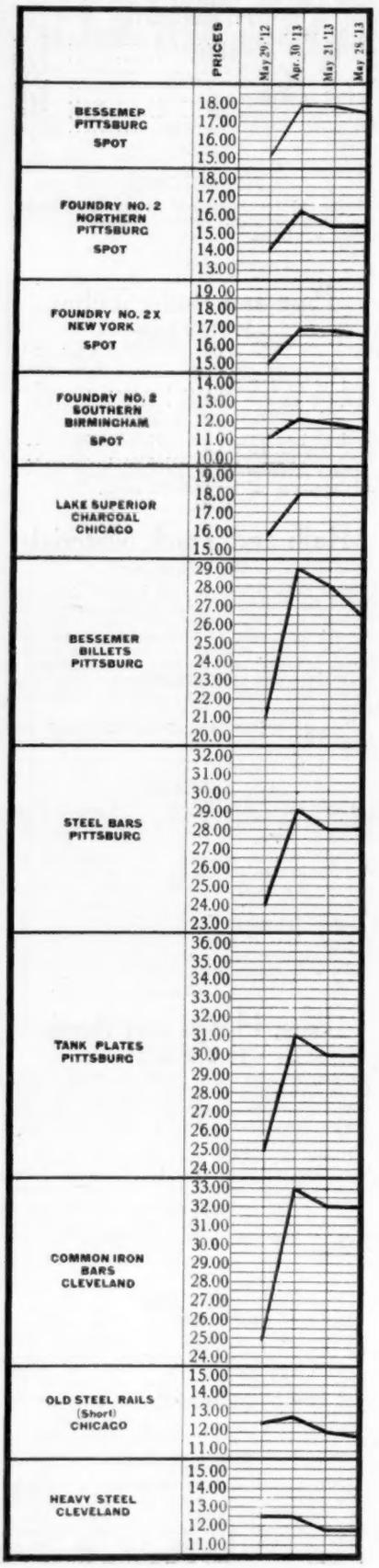
Washington, May 28. (By wire.)—President Wilson's attack on lobbyists now in Washington and the statement that he has no anxiety the tariff bill will not pass in substantially the shape left by the house is considered to give strength to Senator Stone's declaration that the metal schedule will not be the object of a general slash.

The senate Democratic conference today is discussing the Cummins resolution asking an investigation of the president's charge of lobby activity here. The full majority of the finance committee began work today considering the recommendations of the sub-committees which completed their hearings last night. It may require a week before the bill goes to caucus. Many amendments are to be recommended, among them being important ones to administrative features. Chairman Simmons is discussing with Secretary Bryan the exemption clause for American bottoms and other questions following objections of foreign countries. The claim is made that certain clauses of administrative schedules would abrogate treaties.

On The Job

Washington, May 28. (By wire.)—Joseph E. Davies, appointed by President Wilson to be commissioner of corporations, took the oath of office yesterday. He may continue as secretary of the national committee.

PRICE CHART



Producing Iron and Steel Rolls in the West

Description of the Roll Casting Plant Operated by the Hubbard Steel Foundry Co. at East Chicago, Ind.

The recent establishment of a large roll foundry in one of Chicago's manufacturing suburbs emphasizes the growing concentration of steel plants in the western metropolis. The plant is controlled by the Hubbard Steel Foundry Co., and is located at East Chicago, Ind., within a short distance from the steel plants at South Chicago, Gary, Indiana Harbor, Chicago Heights, Joliet, etc. It is said to be the westernmost commercial roll foundry in the United States.

In addition to the manufacture of sand and chilled iron and steel rolls, the Hubbard Steel Foundry Co. turns out a large tonnage of open-hearth steel castings, the plant being equipped to handle the heaviest kind of work. The steel foundry departments have been in operation a number of years and some of their features were described in THE IRON TRADE REVIEW, Oct. 10, 1912, page 669. The roll department, however, has only been recently completed.

The ground plan, Fig. 2, shows the general arrangement of the works of the Hubbard Steel Foundry Co. The shop is located on a plot of ground 1,139 feet long and 365 feet wide, situated between the Calumet canal and the Baltimore & Ohio Chicago Terminal railroad in East Chicago. The building, which lies with its long axis east and west, is located at the western end of the property leaving a space of approximately 500 feet on the eastern end for future extensions. The plant has ample railroad connections.

The main building is 606 feet long and 190 feet wide, divided into three bays or aisles as indicated in Fig. 3. The latter also shows the general arrangement of the high and low elevation roof with which the structure is provided. This roof gives an abundance of light on the molding floor without subjecting the workmen to the direct glare of the sun. The building has a steel frame and the crane runways are carried on extra heavy steel posts. The main or center aisle is provided with three traveling cranes, each having a span of 75 feet. The largest crane has a capacity of 40 tons and the other two are of 35 and 20 tons capacity, respectively. The cleaning room at the west end of the shop is equipped with a 15-ton, 55-foot span crane. The north side bay, containing the core ovens and drying equipment is served by a 10-ton, 55-foot span crane and the open-hearth charging floor in the south aisle is spanned by a 10-ton, 60-foot crane.

The roll-making equipment includes two air furnaces, a ladle pit, a large pit and the customary array of lathes for finishing. The air furnaces are located in the northeast corner of the building as indicated in Fig. 2, and the stock yard immediately adjacent is spanned by a 60-foot, 10-ton gantry crane. The air furnaces are coal-fired, Swindell type, 20 tons capacity each. They are placed close together so that the metal may be tapped from either into a ladle located in the 12-foot pit in front of the furnaces. The gases from each furnace are discharged into an 84-inch steel stack, 60 feet high.

The roll casting pit, which has a number of interesting features, is 15 feet wide, 40 feet long and 10 feet deep inside. Its construction is indicated in Fig. 4. The plant is situated on marshy ground, and 5 feet below the floor level water is encountered. It was necessary, therefore, to waterproof the pit and make it sufficiently strong to withstand the hydrostatic pressure of a head of five feet at the bottom of the pit, equivalent to 329 pounds per square foot. The pit consists of an outer reinforced concrete

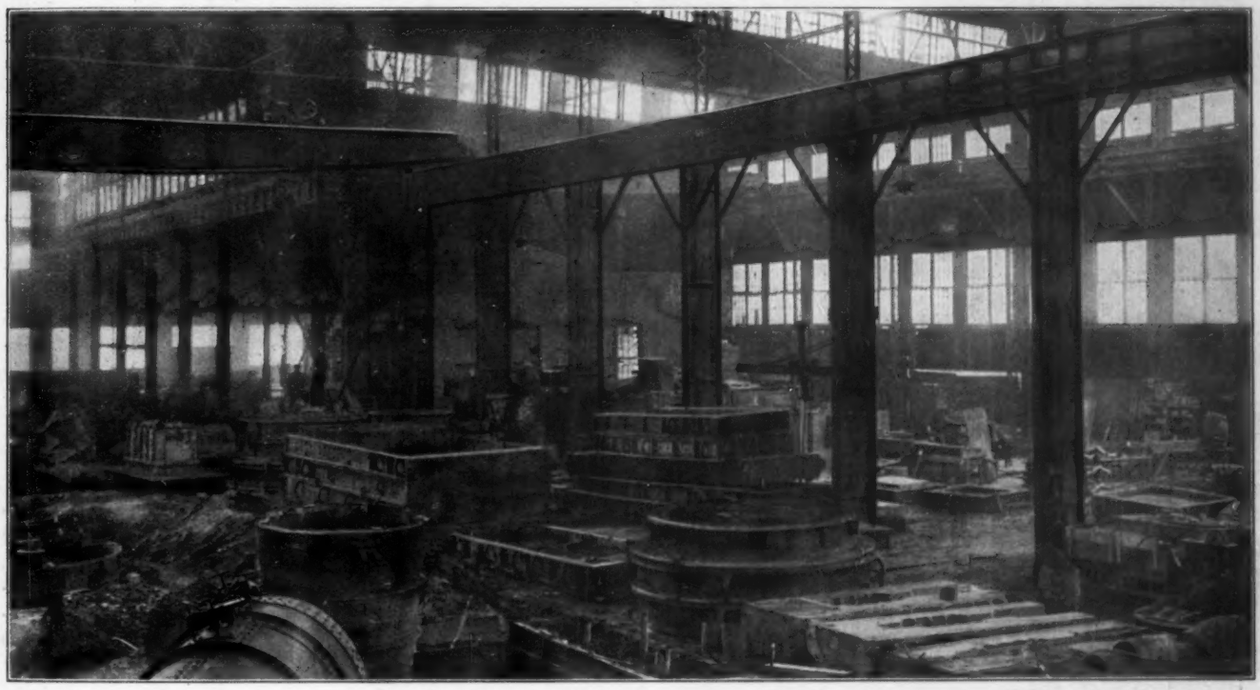


FIG. 1—A VIEW OF ONE SECTION OF THE HUBBARD STEEL FOUNDRY CO.'S STEEL CASTING DEPARTMENT

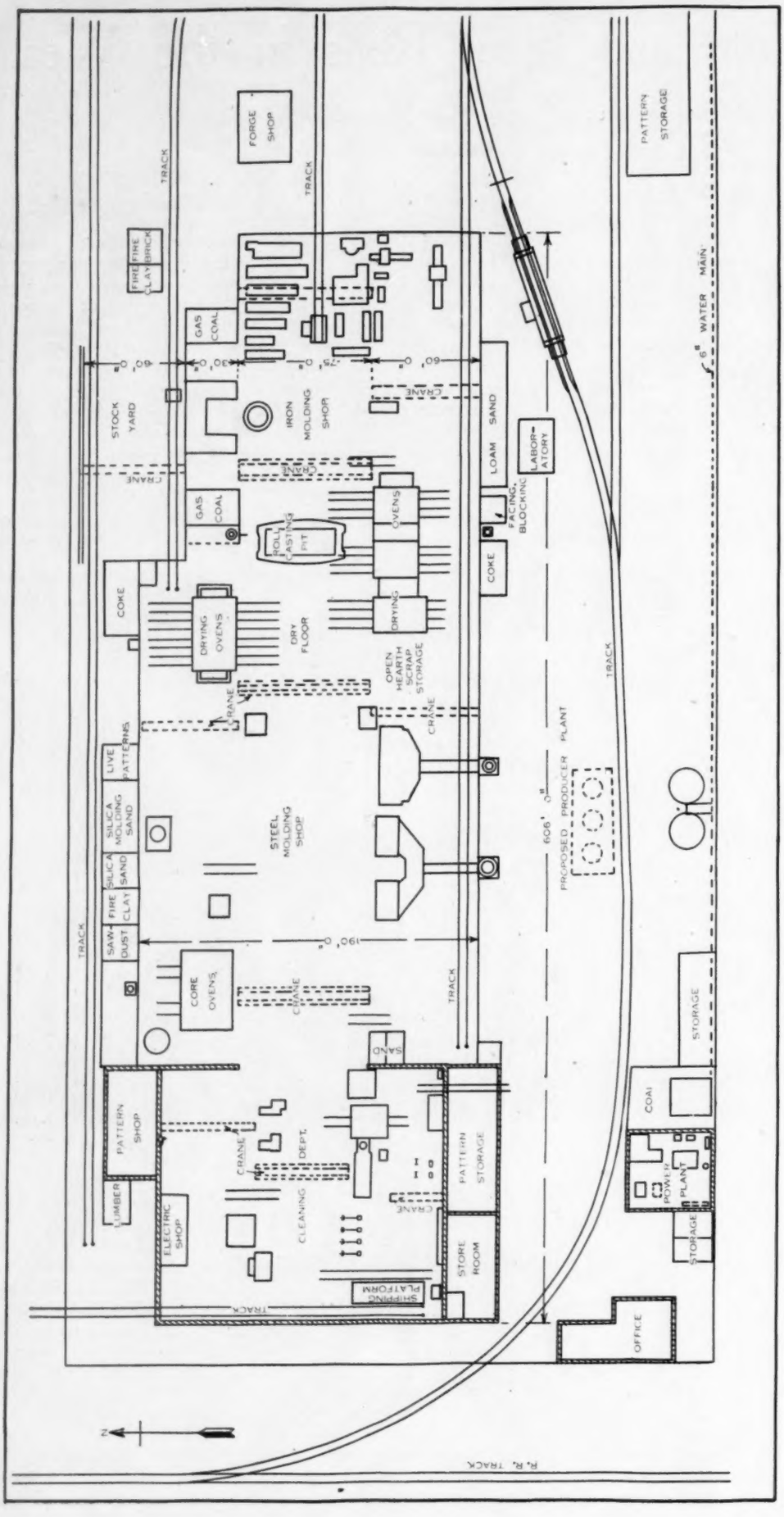


FIG. 2—PLAN OF THE HUBBARD STEEL FOUNDRY CO.'S PLANT

basin with walls about 14 inches thick, a middle layer of cinder concrete and an inner lining of brick. The outer shell is made convex in order to resist the water pressure. The joint between the outer shell and the cinder concrete is made watertight with a pitch preparation. For melting the metal for feeding the heads of rolls and miscellaneous gray iron work, the roll department is provided with a 32-inch Whiting cupalo. The rolls are made in the customary manner in vertical iron flasks, the sand molds being swept-out.

For finishing rolls a full equipment of lathes, grinders, drills, boring mills, etc., have been installed in the extreme eastern end of the shop. There are six roll lathes ranging from 28-inch to 50-inch swing. The roll-turning equipment also includes a 36 x 172-inch grinder for grinding chillled rolls. A track enters the roll-finishing shop as indicated in Fig. 2, thereby facilitating shipments.

Cleaning Department

The cleaning department is situated at the west end of the shop, the steel foundry occupies the middle section and the roll shop is located in the east end in a new extension recently added to the steel foundry. For melting steel, two oil-burning, standard design, acid open-hearth furnaces, 20 and 30 tons capacity, respectively, are provided. They are located in the south bay in the middle of the shop, as indicated in Fig. 2, so that the molten metal need be carried only a minimum distance. The furnaces are hand-charged and

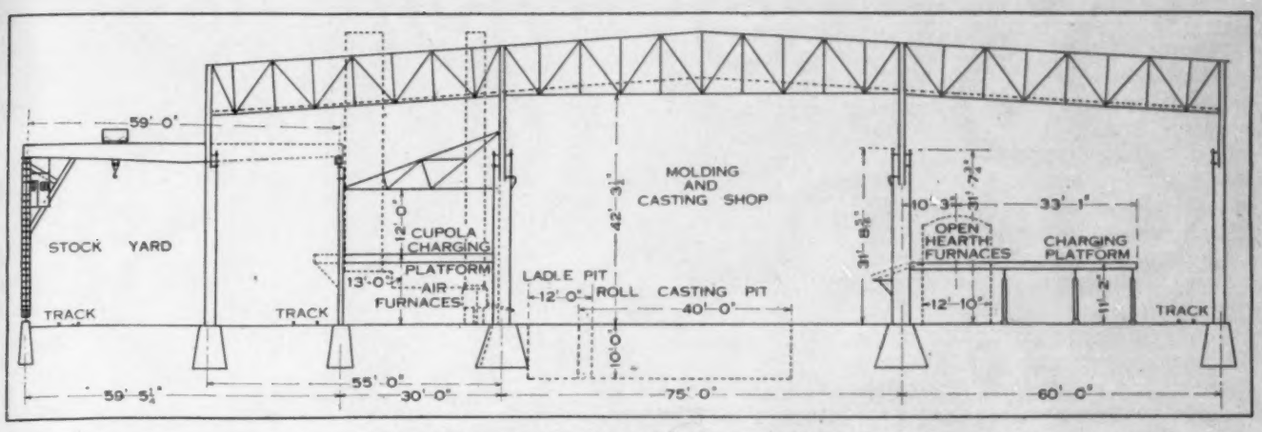


FIG. 3—SECTION THROUGH THE ROLL CASTING SHOP

the space around the checker chambers under the platform is used for the storage of surplus bricks and other material. The oil for the furnaces is carried in two 47,000-gallon storage tanks situated in the yard near the property line. Along side of and also opposite the furnaces are several coke-fired mold drying ovens, the largest being 18 feet wide and 25 feet long.

Steel castings frequently require heat treatment to remove shrinkage strains and for this purpose several large annealing ovens have been provided. They are installed in the cleaning room, west of the open-hearth furnaces. The larger one is of the Swindell type with a movable bottom carried on a car. This furnace is 8 feet wide and 20 feet long and its companion is 6 x 16 feet. The cleaning department also is provided with two motor-driven cold saws and four swing grinders; the latter are driven by 7½ horsepower individual motors.

Work of Portable Oxy-Acetylene Outfit

During the recent flood, two of the largest bridges in Indianapolis were wrecked. The structures, one of which spanned the White river at Washington street, and the other Fall creek at North Meridian street, were of stone and concrete, with framework of heavy steel girders, and when they went down, these supports were reduced to scrap.

To cut away the steel wreckage, portable oxy-acetylene torches were used and the girders were quickly severed and placed in position to be easily removed. The average time consumed in cutting a girder was a little over five minutes, and the entire work of cutting away the twisted mass of wreckage took only three days, thereby materially hastening the construction work on the bridges. The portability of the oxy-acetylene outfits, which were furnished by the Prest-O-Lite Co., Indianapolis, proved a great aid in the speedy removal of the steel wreckage.

An Unusual Water Power Station

In connection with the construction on the White Salmon river, Washington, 75 miles east of Portland, Ore., of the 20,000-horsepower hydro-electric plant, it was found necessary by the Stone & Webster Engineering Co., Boston, to establish a temporary hydraulic plant for the purpose of furnishing power for carrying on the work incident to the building of the large project.

A power flume, 9 feet 3 inches wide, built of wood, diverts water from the stream through the new 125-foot dam now in process of construction, carrying it to a point a few hundred feet below the dam, where the small wooden power house has been established, operating under a 13-foot head of water. The prime mover is a 54-inch turbine, capable of delivering at 13-foot head a maximum of 300 horsepower. This is direct-connected to a generator rated at 150 kilowatts and 440 volts. The electric power is used for various purposes on the immediate work, including quarrying on top of the hill, 400 feet above the dam, operating concrete mixers, lighting, drilling, etc. It is also used at a point more than a mile down the river, where the power house is being built, and to to which point it is transmitted at 6,600 volts. The depth of water in the flume is kept at 6 feet by an ingenious arrangement of gates such that when the water falls below 6 feet a by-pass is closed and the flow is built-up; when the water tends to exceed 6 feet, the by-pass is opened wide and the excess water thrown into the bed of the stream between the big dam and the temporary power house.

This development, which is to be operated by the Northwestern Electric Co., of Portland, will have a head of 175 feet and an impounded volume of 40,000,000 cubic feet of water (1,250,000 tons). This water is gathered from a drainage area of 350 square miles and is held back by a concrete dam of the solid gravity type, 470 feet long, with a 250-foot spillway measuring 125 feet high. Water will be carried from the dam to the power house by a wood stave pipe, 5,100 feet long and 13 feet 6 inches in diameter, emptying into a concrete forebay. From this point two pressure pipes, 700 feet long and 9 feet in diameter, will give the operating head of 175 feet. The purpose of the development is for lighting and power in Portland and vicinity.

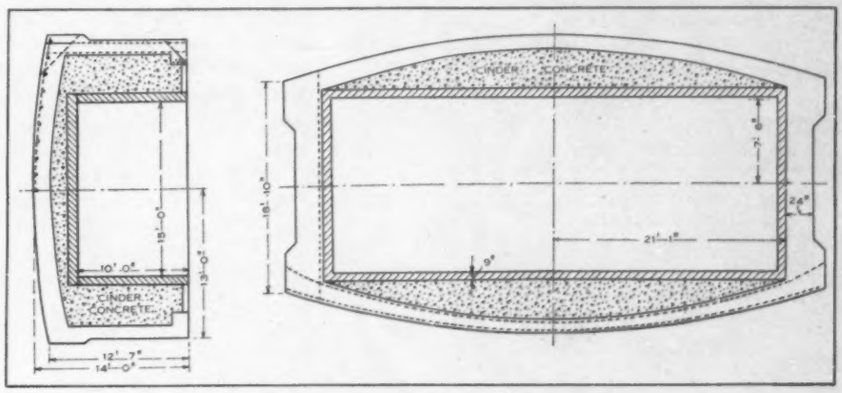


FIG. 4—PLAN AND SECTION OF THE CASTING PIT

High Speed Drilling Attachment

The Graham Mfg. Co., Providence, R. I., is manufacturing a new line of drill speeders, or high speed drilling attachments, which are designed for use on drill presses on jobs on which small holes are to be drilled. The attachments are designed for use on all drilling machines from 20 inches upward, and it is claimed that a speed three times greater than the main machine is obtained by their use. The general advantage of the device is that it converts a slow-running drill press into one of high speed, thus saving the cost as well as space required for an extra high speed machine.

The shank has a standard taper with a case-hardened gear fastened to the bottom. This gear meshes into two pinions mounted on case-hardened studs. Integral with these pinions are a pair of large gears, which in turn mesh into the spindle pinion from opposite sides. The spindle and pinion consist of one piece of hardened tool steel and a chuck may be attached or the spindle may be extended downward and a hole cut into it so that taper shank drills can be used.

It is claimed that the duplex arrangement of the gears eliminates the side strains to a great extent, and that there is no end-thrust

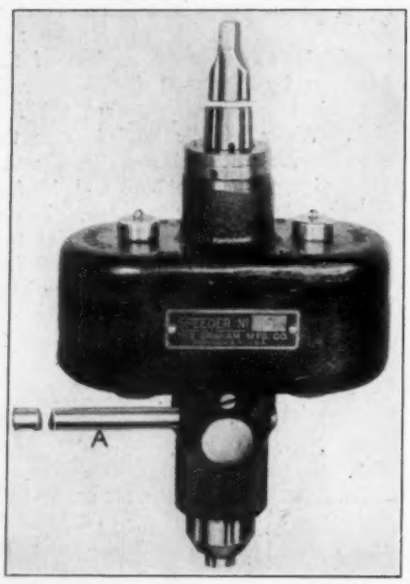


FIG. 1 — HIGH SPEED DRILLING ATTACHMENT

transmitted through the case. A ball-bearing is placed on a wide shoulder at the bottom of the shank. Below the ball-bearing is the top of the spindle, nothing intervening but the ball-bearing between the pressure applied to the shank from above, and the pressure delivered to the spindle, chuck and drill below. This arrangement is shown in the sectional view, Fig. 2.

Alignment is attained by reducing the lower end of the shank and extending it downward until it is almost even with the top of the chuck. This extension, or tail, forms a long

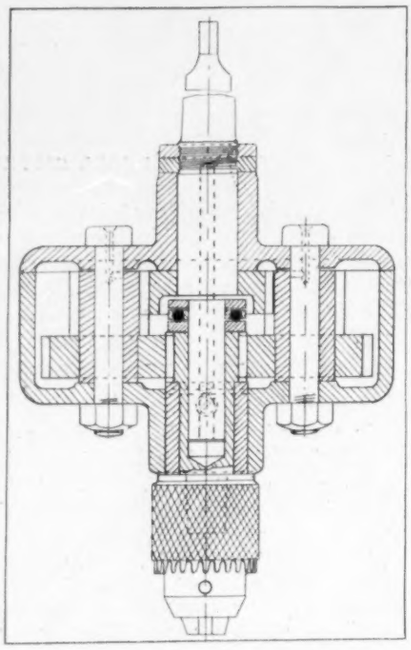


FIG. 2—SECTIONAL VIEW OF DRILLING ATTACHMENT

bearing inside of the spindle. Further support is given the spindle by the bushing on the outside, which is also made to take up wear. The two studs upon which the intermediate gear clusters are mounted serve also to hold the case together.

Another type of attachment with a sensitive feed lever is also made by this company. This device permits the main feed mechanism of the machine to be set at any desired point and locked; the actual feeding of the drill is actuated by mechanism within the speeder. This style is not intended for heavy, constant or manufacturing service. It is designed for use on all classes of fine drilling, such as making holes to lines, making templates, jig holes, lay-outs, dies, dowel, oil, pin holes, etc. The feed mechanism of the main machine usually is not sufficiently sensitive, therefore a spring return lever is necessary. The speed is increased three times, and all gearing is arranged in duplex. In order to obtain vertical traverse, the spindle is mounted on a bronze, racked sleeve, and the return spring and the feeder lever are fastened to the pinion which meshes into this rack.

Concrete Building Tests

A bulletin entitled "Tests of Reinforced Concrete Buildings Under Load," by Arthur N. Talbot and W. A. Slater, has been issued by the Engineering Experiment Station of the University of Illinois, Urbana, Ill. This bulletin gives a detailed description of the methods developed for measuring the stresses produced in steel and concrete in reinforced concrete buildings under load. By the use of delicate measuring apparatus, the minute stretches and shortenings which occur in the beams, columns and floor slabs of a reinforced concrete building while under load, can be measured. The results of the tests on three large reinforced concrete buildings located in three large cities are reported and the data obtained are of a character to permit a discussion of the correctness of the methods of design and the mathematical formulas in use. The bulletin will prove of interest to engineers and architects and is of general interest on account of the light it throws on the safety of full-sized concrete structures.

The annual autumn meeting of the Institute of Metals will be held at Ghent, Belgium, on August 28, 29 and

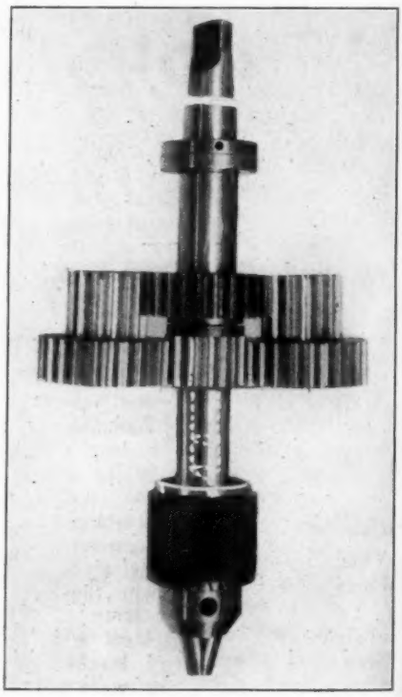


FIG. 3—SPEEDER WITH GEAR CASE REMOVED

30, in connection with the International Exhibition at that place. Among the important subjects that will be considered will be the report of the committee on corrosion.

Interior of pumping station of Baltimore's high pressure system, showing three of the pumps

Report of the Spring Meeting of the A. S. M. E.

The spring meeting of the American Society of Mechanical Engineers, held at Baltimore and Annapolis, May 20-23, was opened by a reception, at which Mayor Preston welcomed the members of the society. He paid tribute to the notable part taken by engineers in the upbuilding of Baltimore since the fire, as well as to the use of structural steel, reinforced concrete and modern machinery made available by their skill, of which the city's high-pressure pumping station was a striking example.

Oberlin Smith, president of the Ferracute Machine Co., Bridgeton, N. J., responded. He was followed by Mendes Cohen, dean of Baltimore engineers, who was prominently identified with the pioneer railroad enterprises of the country, ending his professional career as president of the Pittsburgh & Connellsville railroad, 1872-5. Mr. Cohen traced the history of railroad building and the enormous development of the iron and steel industries which has kept pace with it.

At the first business session interest centered largely in an able report presented by Wilfred Lewis, president of the Tabor Mfg. Co., Philadelphia, as chairman of the "committee of standards for involute gears".

Although these gears first came into use nearly 60 years ago and have been the dominant type, as compared with cycloidal, for about half that time, it is only lately that the rise of the automobile and other large gear-using lines of manufacture has forced a reconsideration of the standards now in use.

The 14½-degree standard, ordinarily known as the Brown & Sharpe, is that commonly accepted; but, according to Mr. Lewis, it constitutes no more than a modified type of involute gearing. The cycloidal system which preceded it was also a good one and for many years had no serious rival; but neither is a true involute system and cannot claim all the advantages inherent in the involute form of tooth.

What Standard Should Include

The majority of the committee expressed the belief that a standard of involute gears should include in its scope a 12-toothed pinion, and all combinations between that and a rack, and that the most desirable system from every point of view is that which insures absolute freedom from interference between all combinations, with a liberal arc of action abundantly to cover the pitch in every case. To meet these conditions, nothing better has been found than an obliquity of 22½ degrees and an addendum of ⅞ module or 0.28 pitch, to which should be added for completeness a dedendum of one module, and fillets generated by a rack tooth with rounded corners prolonged to one module.

Such a system has very decided advantages, against which must be weighed the objections raised as to journal pressure, back-lash and wear. Although the thrust between centers may be 50 per cent greater than for the B. & S. standard, it has been shown repeatedly that this additional thrust, when compounded as it must be with the tangential driving force, adds less than 5 per cent to the actual journal pressure, and it is, therefore, not a serious consideration. In regard to back lash, the same care in cutting should produce equally accurate results, and that although the same depth of wear will certainly cause back lash to increase with obliquity, compensation for this appears in the fact that the greater the obliquity the better the distribution of wear. This combination of obliquity and addendum also makes very strong teeth and the obliquity adds materially to the facility with which they can be milled or hobbed, and ground when need be, after hardening. Special considerations will no doubt always influence the choice of these two variables, obliquity and addendum, and in some classes of machinery where the pinions may never have less than 15 or 18 teeth, less obliquity might reasonably be employed, but for all kinds of practice in general, a majority of the committee favored the adoption of 22½ degrees obliquity with an addendum of ⅞ module. That such teeth will run smoothly and efficiently has been clearly demonstrated, but the experiments have not been sufficiently prolonged to determine the effects of wear and the resulting noise.

The majority report was signed by Hugo Bilgram, of Philadelphia, who is generally credited with the manufacture of the first successful gear planer, and Gaetano Lanza, engineer of the Baldwin Locomotive Works, Philadelphia.

The views of the other two members, E. R. Fellows, manager of the Fellows Gear Shaper Co., Springfield, Vt., and C. R. Gabriel, consulting and designing engineer of the E. W. Bliss Co., Brooklyn, were so widely at variance with the majority that they

did not sign the report. A great deal of experimental work was, however, carried on by the committee members at their own expense, as partially brought out by tables of results published with the report. Mr. Gabriel recommended, with the endorsement of his co-workers, that a fund be raised by the society for the purpose of employing competent men and apparatus to conduct more exhaustive tests, which will probably be done.

The B. & S. Standard

In the discussion which followed, opinion on the wisdom of changing the present standard seemed to be about evenly divided. L. D. Burlingame, of the Brown & Sharpe Mfg. Co., Providence, speaking not for the company, but as an individual member, warned against abandoning a system so long and well tried for another in which he saw serious defects. Nothing in the committee's report was, however, construed as an attack on the Providence concern. Mr. Lewis, in fact, gave unstinted praise to the excellence of the cutters manufactured under the B. & S. system and thought that the latter would continue indefinitely in the favor of many regardless of any objections raised; but he considered its great success more a matter of workmanship than intrinsic merit.

Heavy Motor Trucking

Of practical interest to the great majority of readers of The Iron Trade Review was the record presented in a paper by Walter R. Metz, Washington, D. C., on the electric trucks operated there for the naval ordnance works and other government departments. One of these, constructed for 5-ton loads, showed an annual economy of $2,460 over the cost of teaming. The total economy credited to trucks the first year of their use, with only a part of the equipment then purchased, exceeded $12,000.

Equally interesting facts for private concerns, not mentioned by name, were presented by Mr. Metz. He stated, however, what others have found, that it is difficult to secure comparisons with teaming, for the reason that most firms regard the item of hauling as an overhead expense not worthy of the minute examination given to the other departments.

Need of Motor Truck Auxiliaries

Discussion of the paper brought out the fact that for heavy auto trucking in connection with industrial plants there is need of cranes, winches, etc., especially designed for mounting on such trucks, as well as collapsible boxes and other convertible features adapting them to different kinds and shapes of loads.

New Power Unit Proposed

A lively debate was precipitated by the proposal of H. G. Stott, New York, to introduce a new unit of power known as the myriawatt—literally 10,000 watts—which will be international in its application and afford a definite basis of comparison for all units of energy, both thermal and mechanical. As stated by Mr. Stott:

In American and European practice, at the present time, there are in use many empirical units, the use of any one of which is restricted to a distinct territory. A few of the more important ones are, horsepower, boiler horsepower, kilowatt, cheval a vapeur, pferde-kraft and poncelet. Obviously an engineer in attempting to compare data from a foreign country, is compelled to face a confusion of terms, which usually can be made intelligible only by laborious calculations.

To form a connection between the boiler or producer output, the engine and generator output, the term "myriawatt", derived from the Greek "myria", meaning 10,000, and the term watt, is proposed.

For the purpose of standardization, the British thermal unit, 1/180 of the heat required to raise one pound of water from 32 degrees Fahr. to 212 degrees Fahr. and the equivalent evaporation from and at 212 degrees Fahr. is used.

The adoption of the myriawatt has been recommended by a joint committee of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, but no definite action was taken at the Baltimore meeting. The general trend of sentiment seemed unfavorable to the term.

Gas Engines and Blast Furnace Gas

An extremely valuable paper on the "Practical Operation of Gas Engines Using Blast Furnace Gas as Fuel" was presented by Charles C. Sampson, of the Joliet, Ill., works. of the Illinois Steel Co. This paper, which was printed in The Iron Trade Review, May 15, had been widely read and discussed in advance of the meeting. The methods of cleaning the gas and results obtained in regular practice, which have been closely paralled in the United States and on the continent of Europe, aroused particular interest.

While not officially discussed at the meeting, there was considerable talk among members in relation to the economies now being effected by the use of low pressure steam turbines operated on the exhaust from rolling mill engines and other reciprocating units, as at the Illinois Steel Co.'s works and the Wisconsin Steel Co.'s plant at South Chicago, the Tennessee Coal, Iron and Railway Co.'s mills at Ensley, Ala., and the American Sheet & Tin Plate Co.'s works at Vandergrift, Pa. This is a subject which will be given attention in more detail at a later meeting.

Tests of Hydraulic Buffer

Of far wider application than its immediate subject indicated was an account by Carl Schwartz, assistant engineer of the New York Central Lines, of tests of the largest hydraulic buffer yet constructed, which has been installed in the Grand Central terminal, New York. This was built in England and designed to withstand the impact of a 1,000-ton train, including the 100-ton electric locomotive.

The buffer tested consists of a cast steel cylinder of 22 inches internal diameter, or 380 square inch area, and 11 feet working length. The cylinder is grooved to permit a variable quantity of water to pass by the piston, the amount depending upon the position of the piston, and is the largest with the piston drawn out in position to receive a train.

Operation of Buffer

The piston proper is attached to a steel ram 10 feet in diameter, extending through a stuffing box, and carrying at its extreme end a head of cast steel with a wooden protection board accurately aligned with the locomotive buffer. The buffer cylinder is connected to water mains, the pressure of which is sufficient to drive the piston out, and the water discharged during the stroke runs to waste.

The buffer is installed rigidly upon and partly imbedded in a block of concrete, 20 feet long, 12 feet wide and 10½ feet deep, a total of 90 cubic yards. It is held on each side by five bolts, 2⅜ inches in diameter extending through the foundation into bed rock. The weight approximates 390,000 pounds. Results of tests showed that the bulk of the energy was absorbed during the first ¼ second of the stroke. The impact was considerable after striking but the pressure fell off immediately after, exceeding the maximum.

Use in Mill Service

The principle of this buffer, which merits detailed attention from those especially interested, can be advantageously applied in mill operation and

other heavy industrial service where there are excessive shocks to be taken up. In the discussion it was also pointed out by Arthur E. Johnson, of the ordnance works at Washington, that it might be used to absorb some of the shock from the recoil of a heavy disappearing gun. Other members asked whether larger cylinder diameters and shorter strokes would not be feasible and referred to the desirability of using some non-freezing fluid, such as oil, in place of water, with connection to a return pressure tank.

Dangers From Patent Law Changes

The proposed changes in the patent law and dangers that may arise from hasty, ill-advised legislation, were ably presented by Edwin J. Prindle, of Prindle & Wright, New York.

The decision of the supreme court in the Mimeograph case, sustaining the right of the patentee to require the purchaser of the machine to buy of the patentee ink and paper for use on it, has resulted in the introduction of a large number of bills in congress, with a view to cutting down the patentee's monopoly. Mr. Prindle's paper explained the Mimeograph decision and, incidentally ,the general nature of a patent and the monopoly which it grants, and explains the Bath Tub case recently decided by the Supreme Court; the relation of the patent law to the Sherman act and the general nature of the proposed legislation and its effect on the patent law, and upon manufacturers and inventors.

The patent law, said Mr. Prindle, has been a cardinal factor in the development of our country.

Theodore W. Johnson, professor of mechanical drawing at the U. S. Naval Academy, presented a concise well-illustrated method proposed for the shading of mechanical drawing. This comprehends the most important of the rules now used without their complexities and uncertainties and the controversies which arise from their use. The new rule is proposed with a view to reducing the art of shading to a precise and exact system in the interests of rapidity in the execution and reading of drawings and of their appearance.

Reducing Factory Hazards

A series of papers on methods of factory construction and fire protection, with particular reference to the reduction of hazards, was read by Ira H. Woolson, New York; F. M. Griswold, Albert Blauvelt, Chicago; H. F. J. Porter and Jas. B. Scott, of Baltimore. An interesting contribution on "The Protection of Main Belt Drives With Fire Retardant Partitions," was also presented by C. H. Smith.

One of the noteworthy features of the meeting was the informal gathering of members of the society in the new high-pressure pumping station of the Baltimore city fire service, preceded by a demonstration of the system in the city hall plaza.

Baltimore is unique among the municipalities of the country in having adopted for this station engines of the horizontal crank-and-flywheel type, which have recently effected material economies at steel mills and other large industrial plants in handling great quantities of water against high working pressures.

The three units now installed in the plant, which were built by the Allis-Chalmers Mfg. Co., Milwaukee, are duplex, non-condensing Corliss engines, with steam cylinders 22 inches in diameter by 36-inch stroke, and pump plungers of 13¾ inches diameter working in cylinders placed at the opposite end of the frame.

Each unit was, of course, designed for exceptionally heavy service, and the entire water end, with the exception of sole plates, is made of cast steel. Room has been left in the station for the addition of a fourth unit. The pumping engines are so arranged that they can draw water either from the city mains or directly from the adjacent harbor. The normal continuous pressure maintained in the pipe lines is about 150 pounds, but in emergencies it can be increased to 300 pounds, at which head the pumping engines have a capacity of 3,000 gallons per minute each.

Steam Generating

Steam is supplied by three Edgemoor boilers, each with a heating surface of 68,000 square feet, and a fourth is being installed. The boilers are provided with automatic stokers so designed that during the normal no-load period, equivalent to banked fires, the stokers maintain these fires in such a conditions that they are ready for instant response to forcing requirements, controlling the supply of air and fuel in proper proportions for complete combustion.

Boiler feed is furnished, as required, by one or more of five 9 x 5 x 10-inch pumps. The two feed water heaters are of the Cochrane type furnished by the Harrison Safety Boiler Works, Philadelphia. Two air compressors, 9 x 7 and 3½ x 9 inches, operate on the air-lift system. An important function in priming the mains and keeping up the pressure when the larger pumps are not operating is performed by an Epping-Carpenter horizontal, duplex, direct-acting non-condensing pump, 14 and 25 x 12 x 16 inches, which is capable of delivering 1,000 gallons per minute at 32 revolutions per minute.

Heavy Pressure Mains

The underground mains, which include 1,275 feet of 24-inch , 17,052 feet of 16-inch, 28,229 feet of 10-inch and 7,137 feet of 8-inch piping, with 281 gate valves and 226 fire hydrants, were installed by the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh.

After inspecting the pumping station the members were taken for a tour of the harbor on the steamer F. C. Latrobe, as guests of Oscar F. Lackey, harbor engineer.

In the evening a lecture, illustrated by moving pictures, "Around the World in Eighty Minutes", was given by O. P. Austin, secretary of the National Geographic Society. This included recent views of work on the Panama canal.

Excursions to the works of the Maryland Steel Co. and other large plants were arranged for individuals and parties.

Naval Experiment Station

The meeting concluded with an all-day excursion to Annapolis, where an elaborate program for inspecting the work at the United States Naval Academy had been arranged.

There the delegates listened to an address on the "Experimental Station", prepared by Admiral Hutchinson Ingham Cone, engineer in chief of the United States navy. Visitors were also given the opportunity to examine the results of tests being conducted there, as follows:

Corrosion of metals, boiler compounds and lubricants, by Lieut. King.

Photo-micrographic examination of materials of construction, strength of materials and endurance of metals, by Lieut. Daniels.

Tests of sheet and rod packings, valves, gage glasses and pressure regulators, by W. Cole.

Feed water and air heaters, evaporators and distillers, experimental steam turbines, forced draft blowers, heat transmission investigation and boiler tests with oil fuel, by L. Loeb.

Boiler tests with coal fuel, condensers and air pumps, centrifugal and rotary pumps, safety valves, calorimetry and specific heat, by M. L. Baufre.

Chemical examinations, by Dr. Berkeley.

The magnitude of the work of the Experiment Station and its benefit

to the industries of the United States as well as the navy and government departments, was impressed upon the members of the society as it had never been realized before.

The visitors were also shown the shops, torpedo boats, submarine Holland and larger naval vessels, as well the several types of hydro-planes with which experiments are being made.

What is Ethical for Engineers?

During the first business session of the society a lively discussion was precipitated on the proposed "Code of Ethics", modelled after that of the American Institute of Electrical Engineers. Among the sections of interest to managers of large industrial concerns which have occasion to employ consulting mill architects and engineers is the following:

An engineer cannot honorably accept compensation, financial or otherwise, from two or more parties having conflicting interests without the consent of all parties. The engineer, in whatever capacity, whether consulting, designing, installing, or operating, must not accept commissions, directly or indirectly, from parties dealing with his client or employer.

This was amended by the addition of the qualification: "except when given with the full knowledge of all parties concerned."

Adoption of Code

Objection was made to the adoption of the code on the ground that it "simply means engineers should be honest" and is superfluous. In reply it was stated by H. G. Stott and others that the principles laid down are intended for the guidance of the younger engineers, who ought to know what their seniors have come to practice as a result of long professional experience.

A resolution moving the adoption of the code in general was carried. This, however, was qualified by another vote to have copies of the code printed and sent to each member with a ballot enabling each section to be separately ratified or rejected, the preference of the majority in each instance to be mandatory on the council of the society in its final revision and approvel of the code.

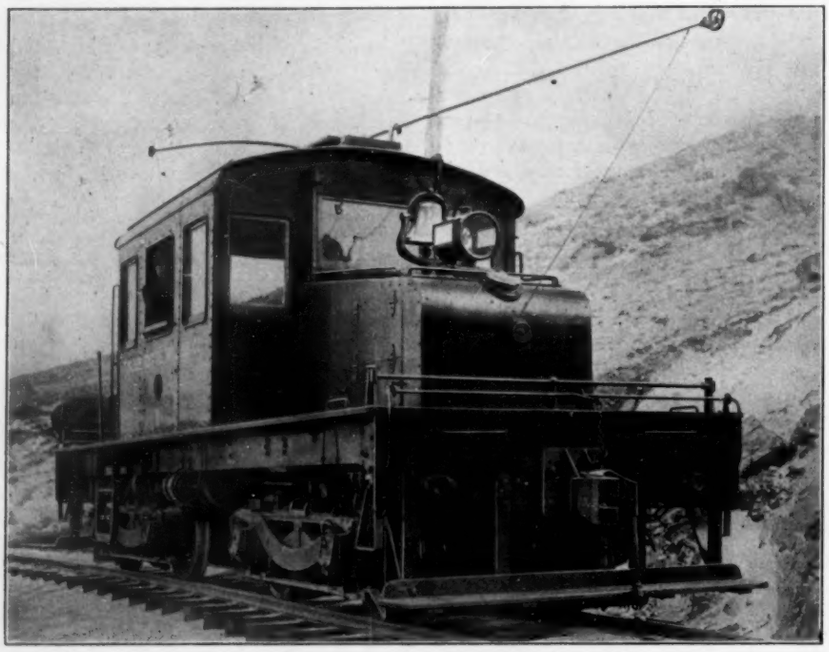
It was also decided by the meeting to have the president appoint a special standing committee on the interpretation of the code.

The report of the membership committee showed extraordinary and unprecedented activity in securing new members. Admission to the society was voted 605 candidates. Secretary Calvin W. Rice, whose work in behalf of the society was warmly praised by the members, emphasized the fact that it represents every phase of the country's industrial activities and is the only organization that does so. Hence there is room for even greater growth and influence.

An additional grade, that of "Associate Member", was created. The age limitation on "Members" is 32 years and the next grade, which corresponds to that of "Member" in its qualifications, is for the benefit of engineers between the ages of 25 and 32. It is not to be confused with "Associate", a grade for which engineering training is not requisite; and the next rule is not retroactive. No re-grading is therefore contemplated.

The arrangements for the meeting were in charge of a committee of the Engineers' Club of Baltimore, Layton F. Smith, chairman, and the successful effort to properly entertain and care for the visitors was warmly appreciated.

All of the sessions were held in the Hotel Belvedere, with President W. F. M. Goss presiding.



A 40-TON BALDWIN-WESTINGHOUSE ELECTRIC LOCOMOTIVE

A 40-Ton Electric Locomotive

During the past few years the application of electric locomotives to many phases of industrial service has grown rapidly. One of the many uses to which these locomotives has been put is for switching cars in plant yards, thereby eliminating the switching charge made by the railroads. Frequently a manufacturer is compelled to haul his raw material and finished product a considerable distance to and from his plant to connect with a steam road.

Locomotives for this service are economical of power consumption in view of the fact that slow-speed motors are employed and frequently no additional generating apparatus is necessary to that already installed. In the accompanying illustrations is shown a 40-ton Baltimore-Westinghouse electric locomotive, which is used for hauling ore concentrates from the plant to the main lines of the Chicago, Milwaukee & St. Paul, Northern Pacific, Butte, Anaconda & Pacific and Great Northern roads at Butte, Mont. The electrical equipment for this locomotive was furnished by the Westinghouse Electric & Mfg. Co., Pittsburgh, and consists of four 90-horsepower, 500-volt, commutating-pole motors especially designed to give good commutation at all loads in normal service.

Acquires Interest in Tacoma Plant

James Macfarlane, of Seattle, Wash., has recently acquired the interest of Henry Mohr, V. R. Gifford, James R. Thompson, former stockholders in the Nisqually Iron Works, Tacoma, Wash., and at a recent meeting of the board of directors was elected president and treasurer of the company. Associated with Mr. Macfarlane are A. G. Browne, vice president and general manager and W. C. Morrow, secretary.

THE ABC OF IRON AND STEEL

The Manufacture of Open-Hearth Steel--III

By Kenneth Seaver

THE following table, taken from Campbell, shows the average elimination in two series of heats, Group I of 19 heats on producer gas; Group II of six heats with oil vapor:

Nature of sample		Group I	Group II
Pig iron, pounds.....		11,700	20,700
Steel scrap, pounds....		45,550	36,800
Composition of original charge, per cent (estimated)	SI	0.40	0.65
	Mn	0.90	0.85
	C	1.00	1.50
Metal when melted, per cent	Si	0.02	0.05
	Mn	0.09	0.06
	C	0.54	0.64
Slag after melting, per cent	SiO_2	50.24	49.46
	MnO	21.67	13.16
	FeO	23.91	33.27

With the carbon remaining at approximately 0.60 per cent, certain quantities of manganese and silicon are oxidized by keeping a good heat and by the addition of iron ore from time to time, which should be as free from impurities as possible. Oxygen is the active agent and the efficiency of the ore depends upon its oxide of iron content. To penetrate the slag, the ore should be in heavy lumps. Ore is added according to melting conditions, a hot slag permitting faster additions, whereas the bath is chilled by the ore if the slag is cold. In a high carbon bath, the ore does not react as rapidly as when low in carbon. The character of the slag also influences rapidity of oxidation, which is effected by the following reactions:

Carbon:— $Fe_2O_3 + 3C = 3CO + 2Fe$

Silicon:— $2Fe_2O_3 + 3Si = 3SiO_2 + 4Fe$

Manganese:— $Fe_2O_3 + 3Mn = 3MnO + 2Fe$

As oxidation proceeds, escaping carbon mon-

CHARGING SIDE OF A 200-TON TALBOT FURNACE TILTED FOR TAPPING

oxide induces a bubbling or boiling over the entire surface of the bath and by its own combustion, it exposes the metal to the flame. The oxidation of the carbon follows the complete oxidation of any remaining silicon and manganese.

Ore Calculation

Although it is a simple problem to calculate the amount of ore necessary to oxidize any given amount of impurities in the bath, conditions have such an important bearing that such calculations are never relied upon in actual practice. After the impurities have been sufficiently oxidized, the bath is ready for recarburizing, or recarbonizing, as it is sometimes termed. The slag serves as a cover to protect the metal from oxidation and also to transmit the heat and oxygen to the bath. Its office is an important one and its control has a marked bearing on the working of the heat. High silicon pig iron in large proportions produces a heavy slag. Low silicon pig and a large proportion of scrap may yield a slag so thin as to protect the bath imperfectly. The slag should be fluid, but not too thin nor too viscous. When the slag is too thin it contains too high a percentage of iron oxide and manganese and it is liable to produce wild metal. The determination of a good tapping slag is only possible from experience.

The following table from Campbell shows the history of the metal and the slag in an acid furnace in 19 and 6 heats respectively:

Subject		Composition, Per Cent. Group I, 19 heats, soft coal Gas		Group II, 6 heats, oil Gas	
		After melt'g	End of opera'n	After melt'g	End of opera'n
In metal	Si	0.02	0.02	0.05	0.01
	Mn	0.09	0.04	0.06	0.02
	C	0.54	0.13	0.64	0.12
In slag	SiO_2	50.24	49.40	49.46	49.36
	MnO	21.67	16.50	13.16	11.30
	FeO	23.91	29.79	33.27	34.11
	MnO+Feo	45.58	46.29	46.43	45.41

The term recarbonization is somewhat of a misnomer. The addition of carbon to bring the heat to a proper percentage is only one object, as others involve the removal or neutralization of gases and oxides retained in the heat, as well as the introduction of metals or alloys. Before the recarburizer is added, the metal upon tapping, will be found to contain certain iron and other oxides, as well as such gases as oxygen, hydrogen, nitrogen and carbon monoxide. These must be removed to secure sound ingots. For acid open-hearth structural steel which may be specified to contain, for example, 0.50 per cent manganese, this element must be added, the original manganese contents of the charge having been oxidized. Certain steel castings and special steels also require a high silicon content, which is attained by the addition of certain alloys

TAPPING A 200-TON TALBOT TILTING FURNACE

high in silicon, such as silicon carbide. For chrome and nickel steels, alloys of nickel and chromium are introduced and aluminum is added in small quantities to quiet the metal in the ladle, to eliminate blow-holes and to promote the fluidity of the steel.

Ferro-manganese is commonly used when making soft steel for structural shapes, but spiegeleisen, ferro-silicon, silico-spiegel and silicon carbide may be employed, the latter for high carbon and special steels. Ferro-manganese is an alloy of manganese, carbon and iron, a standard grade containing about 80 per cent manganese. Pig metal also is used for recarburizing and powdered coal or coke is employed to affect the carbon only. Additions are made in the furnace or in the ladle, or a combination of both. Ferro-manganese, which is used most widely in acid open-hearth practice, supplies the manganese, reduces the oxide of iron remaining in the bath and removes the free oxygen held in gaseous form. The ferro-manganese sometimes is heated to redness before its addition to the molten metal in the furnace or ladle, but this hardly is necessary unless the heats are very small. Although the ferro-manganese mixes better when added to the metal in the furnace, its loss through oxidation in the short time required for melting, if added in the ladle only, will average about 40 per cent.

The manganese addition is computed as follows: Assuming that a soft steel is required containing 0.50 per cent manganese and that this element has been entirely eliminated from the charge; a loss of 40 per cent in the ferro-manganese addition must be assumed, the ferro-manganese containing approximately 80 per cent of manganese, the entire heat aggregating 30,000 pounds. The amount of manganese required then will be 30,000 multiplied by 0.50 per cent or 150 pounds. As the loss will amount to 40 per cent, 150 pounds, which equals 100 per cent minus 40 per cent equals 60 per cent, or 100 per cent equals 250 pounds of manganese. As the alloy contains only 80 per cent of manganese, 250 pounds equals 80 per cent and 100 per cent equals 312.5 pounds of ferro-manganese that must be used.

TILTING MECHANISM OF A 200-TON TALBOT FURNACE

To neutralize or deoxidize the oxides in the metal, thereby minimizing blow-holes, aluminum is added in the ladle or to the metal in the ingot mold, in the form of shot or ingots and in amounts from a few ounces to several pounds per ton of steel, dependent upon the class of steel desired, type of ingot, etc. The aluminum has a tendency to increase the size of the pipe or shrinkage cavity in the ingot, as it localizes the shrinkage. Regulation of the carbon content varies not only with the various classes of steels and with varying carbons, but also according to the melter's ideas and furnace practice.

(To be continued.)

Gas Engines in Blast Furnaces and Steel Plants[1]

Operating Economies Effected by the Large Gary Gas Engine Plant With Data on Costs of Installation, Maintenance, Etc.

By Heinrich J Freyn[2]

Since 1906, American gas engine builders have furnished about 500,000-horsepower of gas engines in units above 500-horsepower capacity, the great majority of which are operated on blast furnace gas. Within the last two years, however, the demand for gas engines seems to have fallen off, and only comparatively few gas engine installations were made in this country.

In Europe, and especially on the Continent, the use of gas power shows a remarkable increase in spite of rather pessimistic views concerning the economic advantage of gas engines, particularly for blast furnace, steel mill and coke oven plant equipment, which were held by some several years ago.

Gas engines today are used almost to the exclusion of steam turbines and turbo-blowers in German steel and coke oven plants, and the demand for large gas engines is so great that the five foremost engine manufacturers in Germany alone are building such engines at the rate of about 120 per year.

The gas engine has been in operation in America in sufficient number and for a sufficient length of time to demonstrate its tremendous economic advantage over any type of steam prime mover for power production in blast furnace plants, steel mills and coke oven plants; and the object of this paper is to present facts and figures which it is believed will demonstrate the superiority of the gas engine for this class of work.

Today we claim the blast furnace and coke oven plants as the natural field for the large gas engine, and where its greatest development will lie in the immediate future. In the enormous field of power generation directly from coal in the large central plants of our cities, the steam turbine is in undisputed possession and will doubtless remain so until the producer gas plant or gas turbine has reached a further stage of development.

The question, gas engine or steam turbine in a blast furnace and steel plant, is strictly an economic one, and an effort will be made to prove that a modern blast furnace or steel plant cannot afford to disregard the signs of the times, which clearly point to the gas engine as the most economical prime mover for their purposes.

Let us assume a blast furnace plant of eight furnaces of about 450 tons capacity each, producing about 3,600 tons of pig iron in 24 hours. The amount of blast furnace gas generated in this plant will be 22,500,000 cubic feet per hour, since it is generally agreed that 150,000 cubic feet of gas are liberated per ton of pig iron produced in 24 hours. This gas will have an average heat value of 95 B.T.U. per cubic foot. Of this total quantity, about 40 per cent, or 9,000,000 cubic feet, is used for heating the blast in the stoves, or is lost by leakage.

HEINRICH J. FREYN

For gas blowing engines, about 2,600 B. H. P. per furnace are required, which consume, at the rate of 12,000 B. T. U. per B. H. P. hour, about 330,000 cubic feet of gas per hour, or for eight blast furnaces 2,640,000 cubic feet. An additional quantity of 460,000 cubic feet per hour for eight blast furnaces will be necessary to produce in gas electric engines the required power to operate the furnace auxiliaries, such as air compressors, mud guns, skip hoists, ore-handling machinery, transfer cars, bells, lighting, etc.

The total quantity of blast furnace gas which has to be deducted amounts to 12,100,000 cubic feet per hour. In other words, there will remain for use, outside of blast furnace operation, 10,400,000 cubic feet per hour. This quantity of gas represents at a heat value of 95 B. T. U. per cubic foot the

[1]From a paper presented at the annual meeting of the American Iron and Steel Institute. [2]Allis-Chalmers Co., Milwaukee, Wis.

total amount of heat of 1,000,000,000 B. T. U. per hour.

To make use of this available quantity of heat for power generation, gas electric engines or steam turbo-generators can be installed. In the former case, the available quantity of heat will produce at the rate of 16,200 B.T.U. per kilowatt-hour at the switchboard, corresponding to an average thermal efficiency of 21 per cent, a total of about 60,000 kilowatts.

If this available quantity of heat is converted into power through gas-fired boilers and steam turbo-generators, the maximum capacity of the power plant would be about 30,000 kilowatts if a heat consumption of 32,500 B.T.U. per kilowatt-hour, or a thermal efficiency of 10.5 per cent of the steam plant is assumed.

Such conditions exist today in this country at Gary in the largest steel plant in the world, where gas engine generators of a total capacity of about 68,000-kilowatt maximum continuous rating will be in operation within a few months. During the last year the maximum continuous rating of this plant was 50,000 kilowatts, and the average use factor, including Sundays, was 64.5 per cent.

Assuming the same use factor in the future, when the plant capacity will be 68,000 kilowatts, and deducting the Sundays, the use factor for 313 working days would be 76 per cent, so that 52,000 kilowatts will be generated every working hour to meet the power demands of the steel plant itself and of the allied industries located in its vicinity.

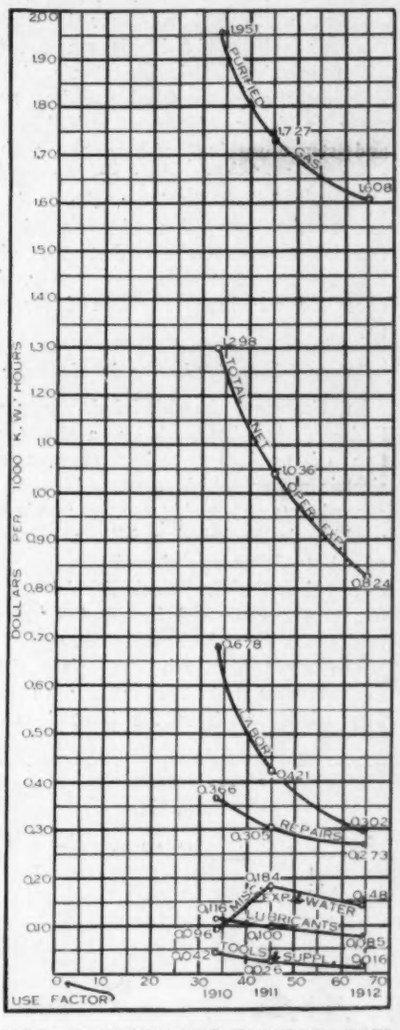
If in this steel plant steam turbines had been installed, only one-half of this power demand could have been covered by burning blast furnace gas under boilers, so that for the remaining 30,000 kilowatts it would have been necessary to use steam coal.

Assuming a coal consumption per kilowatt-hour of 3 pounds of Illinois coal of 10,500 B.T.U. per pound, which would correspond to a heat consumption per kilowatt-hour of 31,500 B.T.U., or 10.8 per cent thermal efficiency at the switch-board, there would have been required 3 × 30,000 × 24 × 313 = 676,000,000 pounds, or 300,000 gross tons of coal per year. At a price of $2.50 per gross ton as fired, which is the prevailing price in that locality, the total expenditure for coal per year would have been $750,000.

As gas electric engines were installed in this plant, the requisite additional power of 30,000 kilowatts is obtained by utilizing directly that portion of the available blast furnace gas which, in the case of steam equipment, it would have been necessary to replace by coal. So that the cost of coal, less the difference between fixed charges and operating expenses per annum of a 30,000-kilowatt gas engine plant and a 30,000-kilowatt steam turbine installation represents the actual annual saving with which the Gary blast furnaces must be credited.

A gas engine power plant of the required capacity of 30,000 kilowatts can today be duplicated for $90 per kilowatt maximum continuous rating, all legitimate expenses included.

A steam turbine plant, with boilers,



COST OF PRODUCING ELECTRIC POWER IN A 50,000-KILOWATT BLAST FURNACE GAS ENGINE PLANT

economizers, superheaters, condensers, pumps, coal and ash handling machinery and other auxiliaries for boiler and turbine operation would cost, under steel mill conditions, from $65 to $70 per kilowatt maximum continuous rating.

Figuring on 15 per cent fixed charges per annum and $70 per kilowatt, there has to be deducted from the gross saving of $750,000 the product 0.15 × 20 × 30,000, or $90,000.

The operating expense, without fuel cost or fixed charges, of the Gary power plant in 1912, at a use factor of 64.5 per cent, Sundays included, was 0.0824 cent per kilowatt-hour, delivered at the switchboard. The corresponding expense for a steam turbine installation of the requisite capacity and operating at the same use factor, may be assumed about 20 per cent lower, or 0.0664 cent per kilowatt-hour at the switchboard, so that the excess operating cost of the gas engine plant per annum would be 0.016 cent × 30,000 × 24 × 313 = $36,000, which amount would further reduce the gross saving.

The total reduction to be made from the gross saving is $126,000, and the net saving per year amounts to $624,000.

An eight-furnace blast furnace plant will produce about 100,000 tons of pig iron per month, or 1,200,000 tons per year, so that the pig iron account should receive a gas credit of 52 cents per ton, simply because no steam coal had to be fired to cover the power demand.

Incidentally, this saving cost of pig iron production represents an equivalent saving of national wealth. That is, it corresponds to a quantity of 300,000 tons of coal put aside annually for future consumption.

The foregoing calculation was made assuming that gas blowing engines are installed as is actually the case at Gary. It is evident that if steam-driven turbo-blowers had been selected, the quantity of available gas would have been much reduced, so that the saving, due to the installation of gas blowing and gas electric engines, would have been much greater.

With turbo-blowers installed the situation would be as follows: The total quantity of blast furnace gas from eight blast furnaces, after deducting the gas used for stoves, lost by leakage and utilized for power purposes of the blast furnace plant itself, but without blowing engine requirements, would be 12,600,000 cubic feet per hour, since for blast furnace purposes alone, about 900,000 cubic feet of gas per hour would now have to be used on account of producing the requisite power for the furnaces themselves with steam equipment.

The gas consumption of steam turbine-driven turbo-blowers of 2,900 B.H.P. capacity per furnace at 12 pounds of steam of 135 pounds gage pressure at the throttle, 125 degrees of superheat, 28.5-inch vacuum, and 63 per cent boiler efficiency, would be about 240 cubic feet of gas of 95 B.T.U. per B.H.P. hour, or approximately 700,000 cubic feet per furnace and 5,600,000

Table I.

COST OF INSTALLATION OF BLAST FURNACE GAS ELECTRIC POWER PLANTS

Power plant No.		1		2		3		4		5
No. of units		17		2		4		4		5
Cap. K. W. max. con. rating		40,000		4,500		9,000		9,000		1,400
Cap. B. H. P., max. con. rating		56,400		6,400		12,800		12,800		16,300
Cost of installation per K. W., max. con. rating:—		Per cent.		Per cent.		Per cent.		Per cent.		Per cent.
(A) Buildings	$ 9.87	11.3			$10.17	10.6	$10.90	10.8	$10.52	10.3
(B) Eng. equipment	71.78	82.0	$75.50	81.8	72.75	74.6	77.78	76.4	80.32	77.3
(C) Gas cleaning plant	5.85	6.7	16.80	18.2	14.40	14.8	13.00	12.8	12.76	12.4
Grand total, power plant complete, per K. W.	$87.50	100.0	$92.30	100.0	$97.32	100.0	$101.68	100.0	$103.60	100.0

cubic feet of gas for eight blast furnaces.

The net quantity of blast furnace gas available for outside purposes would thus be 7,000,000 cubic feet per hour.

If a steam turbine plant were installed to utilize this quantity of gas for generation of electric power, there could only be produced about 20,000 kilowatts, while the difference of 40,000 kilowatts between the actual power demand and the power supply by blast furnace gas would have to be made up by by firing coal under boilers. Assuming the same values as previously regarding the thermal efficiency of the turbo-generator plant, there would be required 400,000 tons of coal per year, which at a purchase price of $2.50 as fired, would be worth $1,000,000 annually.

From this gross saving, the difference in fixed charges and operating expense between gas engine and steam turbine plants must be deducted so that the actual net saving would amount to $832,000 per annum. The gas credit would now be about 70 cents per ton of pig iron produced.

The figures are nothing short of appalling, and the savings so tremendous that any argument of gas engine opponents is silenced. For, whether the thermal efficiency of the steam turbine installation is assumed at 11 per cent or 14 per cent, whether the cost of installing such a plant is $70 or only $50 per kilowatt, whether the operating expenses, without fuel and fixed charges, are 0.0664 cent per kilowatt-hour or only half of this amount, is of comparatively little importance. And, no matter what reasonable claims are made in favor of steam turbo-blower and steam turbine equipment for the great steel plant at Gary or any other plant of similar character, the saving, due to the installation of gas engines, remains so stupendous that the old controversy, steam or gas power, is once for all disposed of in favor of the gas engine.

Power Plant Syndicates in Germany

In Germany the Rheinisch-Westphalische Elektricitatswerk is a corporation of producers and consumers of electric power, which owns and operates several steam turbine power plants working in conjunction with a number of blast furnace and coke oven gas engine installations which furnish electric power generated by surplus industrial gases into the same system.

The great Rombach steel plant supplies electric light and power to the City of Metx, from the blast furnace plant at Maizieres, which is understood to be a very profitable business. Incidentally, it should be mentioned that the gas engine plants of this concern are among the very oldest in existence, some of the present gas engines having been installed as early as 1904.

A similar installation exists at the Royal Prussian coal mines at Heinitz in the Saar district, where a coke oven gas engine power plant of 6,800 kilowatt capacity operates in parallel with a steam turbine plant of 9,000 kilowatt capacity, several miles distant. A distributing system of about 62 miles in length, connects 27 different coal mines to the two central stations. The generators in the gas plant are built for 66 per cent, and those in the steam plant for 80 per cent power factor, so that the gas engines naturally take the bulk of the constant load, while the steam turbines handle the frequently recurring peak loads. These two plants are a marked financial success. And, although the steam turbine plant is one of the finest and most economical in Germany, the cost of power produced in the gas engine station is, nevertheless, lower than that of the steam power plant.

A detailed analysis of all factors determining the economic value of a

Table II.

COST OF INSTALLATION OF BLAST FURNACE GAS BLOWING ENGINES

Plant No.		1		2		3		4		5
Number of units installed		16		4		6		4		4
Capacity installed, B. H. P.		42 000		10,500		14,000		10,500		10,500
Capacity operating, B. H. P.		31,500		7,875		14,000		8,000		8,000
Total displacement of operating engines, cu. ft. per minute		360,000		90 000		180,000		90,000		90,000
Investment per B. H. P. installed:		Per cent.		Per cent.		Per cent.		Per cent.		Per cen
(A) Buildings	7.87	10.7	$59.70	88.4	$8.99	12.0	$10.69	13.8	$10.75	12.7
(B) Engine equipment	61.40	83.1			55.20	74.0	60.05	77.3	67.40	79.4
(C) Gas cleaning plant	4.58	6.2	7.88	11.6	10.07	14.0	6.98	8.9	6.79	7.9
Total	$73.85	100.0	$67.58	100.0	$74.26	100.0	$77.72	100.0	$84.94	100.0
Investment per B. H. P. operating:										
(A) Buildings	$10.50	10.7	$79.50	88.4	$10.92	12.0	$14.06	13.8	$14.20	12.7
(B) Engine equipment	82.00	83.1			70.43	77.0	78.94	77.3	88.90	79.4
(C) Gas cleaning plant	6.10	6.2	11.81	11.6	10.07	11.0	9.19	8.9	7.90	7.9
Total	$98.60	100.0	$91.31	100.0	$91.42	100.0	$102.19	100.0	$111.00	100.0
Investment per cu. ft. displacement of operating engines:—										
(A) Buildings	$ 0.92	10.7	$6.97	88.4	$0.85	12.0	$1.25	13.8	$1.26	12.7
(B) Engine equipment	7.18	83.1			5.47	77.0	7.02	77.3	7.88	79.4
(C) Gas cleaning plant	0.54	6.2	1.03	11.6	0.78	11.0	0.81	8.9	0.79	7.9
Total	$8.64	100.0	$8.00	100.0	$7.10	100.0	$9.08	100.0	$9.93	100.0
Investment for 500-ton blast furnace:										
(A) Buildings	$41,500	10.7	$313,300	88.4	$38,250	12.0	$56,250	13.8	$56,500	12.7
(B) Engine equipment	323 000	83.1			246,500	77.0	315,750	77.3	350,000	79.4
(C) Gas cleaning plant	24,200	6.2	46,550	11.6	32,250	11.0	36,750	8.9	36,000	7.9
Total	$388,700	100.0	$359,850	100.0	$317,000	100.0	$408,750	100.0	$442,500	100.0

prime mover, and on which the selection of power plant equipment should always be based, is primarily concerned with the question of the total cost of power production. This cost is usually sub-divided into the following main items: Fixed charges, fuel cost and net operating expenses.

The fixed charges comprise depreciation, interest on the money invested, insurance and taxes; and their value depends upon the cost of installation and upon the assumed or customary percentage rate for amortization. The fuel cost is the criterion of the thermal efficiency of the power plant at a given price and heat value of fuel and for similar load conditions, and the operating expenses should reflect the physical condition of the equipment, the efficiency and simplicity of design, and to a certain extent, the reliability of the machinery.

Depreciation Rate

The first important question to be decided is what percentage should be assumed to cover amortization of the power plant. Heretofore it has been customary to charge a much higher depreciation rate on gas engine equipment than on steam installations. This is obviously wrong if the proper meaning is given the term depreciation. That a gas engine plant should have a shorter life than a steam turbine installation is inconceivable, and the experience of the last eight or ten years conclusively proves that there is no reason for such an utterly arbitrary and unfair assumption.

At an accepted rate of interest of 6 per cent, and assuming 7 per cent for depreciation, the life of equipment would be about 10 years. Numerous instances could be cited of earlier gas engines of 1904 vintage, which still are in perfectly satisfactory operation in steel plants abroad, although at that time the double-acting, four-cycle gas engine had just been introduced.

During a recent visit to Europe I found still in use at the Cockerill Works at Seraing, the old, single-acting gas-blowing engines, which were installed in 1900. And even the first 200-horsepower blast furnace gas engine, built at these works in 1898, although obsolete, is still performing its work satisfactorily.

The largest gas engine power plant in the world, that at Gary, has now been in operation over five years, but even the most pessimistic investigator would have to concede that the Gary gas engines are good for at least another term of five years.

Seven per cent depreciation figured on gas engines does not mean that these engines will be useless at the end of ten years, because of wear and tear or on account of age or decrepitude, but simply that they must be written off in that time, due to obsolescence.

If the rate of progress of the last few years continues, it would not be prudent to reckon with more than 10 years' life of the equipment, because new inventions may revolutionize our present methods of power production so completely that it would be impossible for financial and economic reasons to maintain profitably the old equipment.

The steam turbine is affected in precisely the same manner. And, indeed, in certain power plants steam turbines were replaced or practically rebuilt after a few years of service, since such improvement had meanwhile been made in the art that it was prfitable to rebuild these machines.

Frequently, the first cost of steam turbine power plants of hundreds of thousands kilowatts capacity is compared with that of gas power installations of a few thousand kilowatts rating, but any engineer who has built power plants knows that there is considerable difference in first cost according to plant capacity.

The actual costs of installation of a number of blast furnace gas engine plants in steel works in this country are now available, from which it appears that such electric power plants can be built for from $88 to $104 per kilowatt maximum continuous rating according to size of plant and local conditions.

In the majority of blast furnace installations of the United States Steel Corporation, the original appropriations and the final costs cover not only the gas engines and their installation proper, but steam engines, steam turbines, boilers and condensers, sub-stations, transmission lines, storage batteries, etc., and frequently superfluous and inoperative parts of gas cleaning plants.

The work of reducing the costs on the books to the true figures which can consistently be charged to these plants, is not simple. It requires great care and detailed knowledge of the plants in question. This work was done about two years ago with utmost accuracy for the gas engine installations of the United States Steel Corporation.

To do this work, it was necessary to put all installations under investigation upon the same basis, and it was decided to follow the practice customary in steam turbine plant accounting, that is, to base all installation cost figures on the maximum continuous rating of the generator at 40 degrees Cent. temperature rise. In the majority of cases, the gas engines have a greater capacity in brake horsepower than corresponds to this generator rating, and we agreed to call the maximum continuous rating of these gas engines that kilowatt capacity which at 95 per cent generator efficiency and 80 per cent mechanical efficiency, corresponds to a mean effective pressure in the gas cylinders of approximately 70 pounds per square inch, a value which is universally adopted by gas engine builders.

Table I gives the actual installation costs of a number of gas engine stations in plants of subsidiary companies of the United States Steel Corporation.

Table III.

COST OF PRODUCING ELECTRIC POWER AT GARY

Costs in cents per kilowatt-hour.

	1910.		1911.		1912.	
Capacity in K. W.	40,000		40,000		50,000	
K. W. hours produced	116,535,000		157,742,510		286,575,000	
Use factor, per cent	33.3		45.0		64.5	
Cost of installation per K. W.	$88.00		$88.00		$88.00	
Labor	$0.0678		$0.0421		$0.0302	
Repairs and maintenance	0.0366		0.0305		0.0273	
Lubricants	0.0116		0.0100		0.0085	
Water	0.0074		0.0057		0.0036	
Miscellaneous	0.0064		0.0153		0.0128	
		Per-cent.		Per cent.		Per cent.
Total net operating exp.	$0.1298	17.0	$0.1036	17.0	$0.0824	17.5
Value of gas	.....		0.1508		0.1464	
Cost of purification	.....		0.0219		0.0144	
Total cost of purified gas	$0.1951	25.0	$0.1727	28.0	$0.1608	34.0
Op. costs without fixed charges	0.3249	42.0	0.2763	45.0	0.2432	51.5
Fixed charges at 15 per cent.	0.4520	58.0	0.3360	55.0	0.2310	48.5
Grand total at switchboard.	$0.7769	100.0	$0.6123	100.0	$0.4742	100.0

Plant Costs

The statement covering plant No. 1 includes all items on the cost sheets, with the exception of sub-station equipment, steam turbo-generators and boiler plant, storage batteries, rotary converters and switchboard for these appliances. If switchboards for storage batteries, transformers and rotary con-

verters were added, the installation cost would be increased by $2.99 per kilowatt. The storage batteries themselves, including building, etc., cost $8.91 per kilowatt maximum continuous capacity of the station. Proportion of works' expense and engineering and drafting expenses were omitted in order to bring all station costs on the same basis, and also because in steam turbine plants these items are frequently not included in the total station costs. These expenditures, when added, would increase the unit cost given in the table by $1.54. The total cost, including all items except storage batteries, would then be $92 per kilowatt.

Plant No. 2 has no gas holders, and the costs given include only that portion of the gas cleaning plant which is chargeable to the present gas engine equipment.

The cost figures for plant No. 3 cover the whole installation, including all piping and auxiliaries, all electrical equipment with switchboard and distribution lines, but no transformers, storage batteries, transmission lines to places of consumption of electrical energy, nor equipment of a steam engine generator with its portion of the building.

The gas cleaning plant of this installation includes two gas holders and an enormous amount of gas piping, occasioned by local conditions, while if this plant could have been installed in connection with gas engines located in close proximity—as would be the case in a new plant—its cost would have been only $12.48 per kilowatt.

The gas cleaning installation in plant No. 4 is good for nearly twice the present gas engine capacity, with the exception that a number of Theisen washers would have to be added.

The actual construction costs of plant No. 5 include a steam turbine with condenser, piping and foundation, as well as electric transmission lines. The corresponding expenditures were deducted to arrive at the true installation cost of the gas engine station.

The figures given in Table I coincide fairly well, with the exception of those pertaining to the cost of gas cleaning plants. The discrepancies among the latter are entirely due to differences of design and local conditions. The gas cleaning plants for the smaller installations are much more expensive than that for the larger power plant, because the latter was originally designed with a view of installing gas engines, so that this gas cleaning plant represents the latest and most efficient arrangement. Moreover, some of these smaller plants started out with extreme caution in the matter of gas cleaning and provided, in addition to Theisen washers, expensive hydraulic fans, baffle washers and screen washers, with the necessary gas piping.

Within the last year or two marked progress has been made in the art of purifying blast furnace gas by using simpler and less expensive gas washers, operating either on the dry filter or the wet disintegrator principle. With these improvements, the installation cost of secondary gas cleaning plants will be reduced in the future approximately 15 per cent.

In Table II the cost of installation of gas blowing engines in the same plants is given. To obtain a uniform basis for comparison, it is assumed that each furnace is blown by 3 tubs or 1½ gas blowing engines in all plants under consideration, and requires 45,000 cubic feet per minute displacement of air. The maximum continuous capacity of all engines was based on this quantity (30,000 cubic feet displacement per engine) and 25 pounds blast pressure. The rating of all engines was determined assuming 18 pounds per square inch mean effective pressure and 90 per cent mechanical efficiency of the air tubs themselves, with the exception of one plant, where high-speed gas blowing engines are installed.

The costs given in Table II for plant No. 1 were compiled from the official cost sheets, deducting steam blowing engines and the corresponding portion of a boiler plant. On the other hand, the cost of a gas producer plant of 4,000 horsepower capacity for starting the blast furnaces, was added. In the latest two German blast furnace plants which are equipped with gas blowing engines exclusively, no provision was made for steam blowers for starting the plant; but a producer plant of the cheapest kind without coal and ash-handling equipment, building, gas washers, etc., was installed because the existing secondary gas cleaning plant and the existing gas blowing engines could be used without the slightest difficulty.

In plant No. 3 several high-speed gas blowing engines ae installed. These were built for a maximum blast pressure of only 20 pounds per square inch. The figures in column 3 are, therefore, not exactly comparable with those given for the other plants. No spare engines existed; and, since it was desired to bring all plants under discussion on the same comparative basis, an estimate was made of the cost of installation of two additional high-speed gas blowing engines, and the probable cost added to the actual constuction costs. In column 3, the figues under "Investment per B.H.P. in-

Table IV.

COMPARISON OF COST OF PRODUCING ELECTRIC POWER IN STEAM AND GAS POWER PLANTS

Costs in cents per kilowatt hour.

	8 steam turbine plants.					8 B. F. gas engine plants.				
No.	1		2		3	4		5		6
item.—Item.	Maximum.		Average.		Minimum.	Maximum.		Average.		Minimum.
1—Plant capacity in K. W.	126,000		55,000		10,000	50,000		11,600		1,500
2—Use factor, per cent.	33.3		25.0		10.0	71.5		49.0		22.0
3—Labor	0.1730		0.0902	58.1	0.0434	0.0881		0.0550	33.0	0.0302
4—Repairs and maintenance	0.0740		0.0422	27.3	0.0250	0.1282		0.0733	44.0	0.0273
5—Lubricants	0.0096		0.0054	3.5	0.0020	0.0237		0.0125	7.5	0.0054
6—Water	0.0305		0.0143	9.2	0.0020	0.0162		0.0120	7.2	0.0036
7—Miscellaneous	.....		0.0029	1.9	.....	.....		0.0137	8.3	.....
8—Total net operating expense	0.2414	33.3	0.1550	100.0	0.0850	0.2438	52.2	0.1665	100.0	0.0824
9—Cost of 1,000,000 B. T. U. cents	11.10		8.80		5.20	10.37			8.11	5.89
10—Cost of fuel	0.3960	66.7	0.3100	....	0.1950	0.2441	47.8	0.1530	....	0.0963
11—Total cost of power production without fixed charges	.....	100.0	0.4650	....	.....	.....	100.0	0.3195	....	.....
12—Heat consump. per K. W. hr. B. T. U.	46,400		35,400		29,700	26,000		18,400		16,200
13—Thermal efficiency, per cent.	11.49		9.65		7.35	21.0		18.54		13.12
14—Ratio of plant capacities	1		1		1	0.397		0.212		0.150
15—Ratio of use factors	1		1		1	2.130		1.960		2.20
16—Ratio of net operating expenses	1		1		1	1.010		1.074		0.970
17—Ratio of cost of 1,000,000 B. T. U.	1		1		1	0.934		0.922		1.132
18—Ratio of fuel expense	1		1		1	0.617		0.493		0.494
19—Ratio of actual fuel cost	1		1		1	0.560		0.536		0.436
20—Ratio of total cost of production	1		1		1	.....		0.678		.....
21—Ratio of heat consumption	1		1		1	0.560		0.520		0.545
22—Ratio of thermal efficiency	1		1		1	1.830		1.923		1.785

stalled," are actual costs; but the others are based on the presumable combined cost of the existing plant and two additional spare engines. This was done to show how high-speed gas blowing engines affect the total cost.

Plant No. 5 is not strictly a gas blowing engine plant, and the available cost figures were revised to bring this plant on the same basis as the others.

The costs given in Table II show fairly good coincidence, except for the gas cleaning plants and plant No. 3.

It can be seen from these cost figures that the equipment with high-speed gas blowing engines is a good deal cheaper than that of slow-speed engines, especially when the capacities of plants Nos. 1 and 3 are considered.

Corporation Costs of Installation

The total cost of the new power house at Gary, containing 10 units of 270 kilowatt each maximum continuous rating, when completed, will probably not be over $70 per kilowatt, without the gas cleaning plant. The latter would bring the most of the whole station to a little over $75 per kilowatt.

Prominent central power station engineers in this country agree that the cost of a steam turbine power plant per kilowatt maximum continuous rating varies from $60 to $100, and it is generally conceded that the average is near $80 per kilowatt. There are not many lighting or street railway power plants in this country which cost less than $65 per kilowatt, and the majority of these plants have capacities considerably larger than even that of the Gary gas engine plant, some having as much as 200,000 kilowatt capacity in steam turbines under one roof.

The gas consumption of gas engines at three-quarter load is not very much greater than at full load, and some European gas engine builders even guarantee a heat consumption of 10,000 B.T.U. at full load and 11,000 B.T.U., or only 10 per cent more, at three-quarter load.

Venturi meter tests made on a large gas blowing engine running at constant speed with variable blast pressure showed a thermal efficiency of 26.5 per cent at the shaft for 2,700 B.H.P. and 30 pounds blast pressure and 22 per cent for half load or 1,350 B.H.P.

Under the favorable operating conditions at the Gary plant, the thermal efficiency of the gas engines averages at least 21 per cent, particularly in view of the truly splendid physical condition in which this gas engine plant is kept. All indications of tests and operating experiences here and abroad point in that direction, and I may mention that the largest blast furnace gas engine plant in Germany, which has been in successful operation nearly six years, has an average thermal efficiency of 22.5 per cent, with an annual output of 100,000,000 kilowatt-hours and 65 per cent average use factor.

Theory and practice do not always agree. Theoretically, no coal should be required for raising steam in steel plants where an adequate amount of blast furnace gas is available, but every steel man knows that this is true only so long as the gas will burn under the boilers. Frequently, however, blast furnace gas of poor quality, and particularly washed gas, cannot be made to burn, especially in winter time, without a more or less substantial addition of coal.

To guard against the embarrassment of low steam which often accompanies trouble at the blast furnaces, gas-fired boilers are usually equipped with grates, so that coal can be burned if necessary.

The price of steam coal is constantly increasing without any prospect that it will ever again decline, and the difficulty of moving steam coal, especially in winter time, when it is most needed, becomes more serious from year to year. During the last two years the coal price per gross ton increased in the Pittsburgh district from $1.35 to $1.45 (13,500 B.T.U. per pound) in the Ohio district from $1.80 to $2.25 (13,500 B.T.U.) and in the Chicago district from $1.80 to $2.25 (10,500 B.T.U.). This increase in price is accompanied by a constant decline in quality, but the higher the price of coal climbs and the lower its quality drops, the better are the conditions for the gas engine.

Net Operating Expenses

The operating expenses, without fuel cost or fixed charges, can be subdivided into the following items: Labor, repairs and maintenance, lubricants, water and miscellaneous expenses.

For the Gary plant, the cost of these various items for the last three years of operation is shown in Table III, and

Table VI.

AVERAGE OPERATING RESULTS OF 8 BLAST FURNACE GAS ENGINE PLANTS FOR 1912

Costs in cents per kilowatt hour.

Average plant capacity in K. W.				11,600
Average use factor, per cent.				54
Average net operating expenses:—		Per cent.		
Labor	0.0463	30.6		
Repairs and maintenance	0.0726	47.9		
Lubricants	0.0104	6.9		
Water	0.0068	4.5		
Miscellaneous	0.0153	10.1		
Total	$0.1514	100.0	$0.1514	50.6
Average cost of 1,000,000 B. T. U. in cents		7.89		
Average cost of fuel			$0.1480	49.4
Average total cost of power production (without fixed charges)			0.2994	100.0
Average heat consump. B. T. U. per K. W. hr.				18,450
Average thermal efficiency, per cent				18.5

Table V.

COMPARISON OF COST OF PRODUCING ELECTRIC POWER

Costs in cents per kilowatt-hour

	Gas engine plant				Steam turbine plant			
Year			1910				1910	
Capacity in K. W.			40,000				49,000	
K. W. hours produced.			116,535,000				142,835,000	
Use factor, per cent.			33.3				33.3	
Net operating expenses:		Per cent.				Per cent.		
Labor	$0.0678	52.0			$0.0528	52.0		
Repairs and main.	0.0366	28.0			0.0326	32.0		
Lubricants	0.0116	9.0			0.0024	2.5		
Water	0.0074	6.0			0.0073	7.0		
Miscellaneous	0.0064	5.0			0.0066	6.5		
Total	$0.1298	100.0	$0.1298	Per cent. 40.0	$0.1017	100.0	$0.1017	Per cent. 23.0
Cost of 1,000,000 B.T.U.	*9.5				9.9			
Fuel cost			0.1951	60.0			0.3400	77.0
Total cost of power production (without fixed charges)			$0.3249	100.0			$0.4417	100.0
Heat consump. B. T. U. per K. W. hour.			*19,500				35 200	
Thermal efficiency, %			*17.5				9.7	

*Approximate.

these values are plotted in the accompanying illustration.

To give some idea of the relative cost of producing electric power in blast furnace gas engine and steam turbine plants in this country, the costs and other interesting data obtained in eight steam turbine stations and eight blast furnace gas engine plants were averaged, and the results are given in Table IV.

Results covering two consecutive years of operation of three of the eight steam turbine plants under discussion were available, so that eleven sets of data could be used to determine the averages. These plants are mostly located in the east, and some of them are considered among the best equipped and best managed power plants in the world. Some of the capacity figures and use factors given are approximate. The labor cost includes boiler room and turbine room labor, and the great variations are probably due to the fact that some of the stations are street railway plants. Maintenance includes labor and material in repairs for boilers, steam turbines and auxiliaries.

Gas Engine Installations

The gas engine installations in question belong without exception to subsidiary companies of the United States Steel Corporation. Of the 10 blast furnace gas power plants operated by the Corporation, eight were included in this comparison. The remaining two were omitted, because one is of very small capacity and the other has not been in operation over two years. Three of the plants are located on the Great Lakes, four in the Pittsburgh district and one in the Youngstown district. For all eight plants, cost sheets are available, and the figures given in Table IV are the true averages of the costs covering three years' operation, from 1910 to 1912. The plant capacities were based on the maximum continuous rating of the engines and generators.

Table V shows the actual total operating cost of a 40,000-kilowatt blast furnace gas engine plant and of a 49,000-kilowatt steam turbine plant, for which the use factor happens to be exactly the same. All items are directly comparable, since the fuel cost for the steam turbine plant was corrected for coal of 10,500 B.T.U. per pound at $1.80 per long ton, which is the basis for valuation of blast furnace gas in this gas engine plant.

Referring to the use factor in connection with Table IV, circumstances could hardly have been more unfavorable for obtaining fair average figures on blast furnace gas engine plants than those existing in the years 1910 and 1911, on account of the unsatisfactory condition of the iron and steel trade in this country. The average use factor for the eight gas engine stations under discussion was 46.3 per cent and 46.8 per cent in 1910 and 1911, respectively. In 1912 it rose to 54 per cent, with the result that the cost figures for these plants were substantially improved.

This is shown in Table VI, from which it will be seen that the average net operating expenses for 1912 were 9 per cent better than those given in Table IV, and that the average total cost of power production (without fixed charges) improved 6.3 per cent.

Gas Engines and Steel Mill Loads

Load conditions in steel mills are generally favorable for gas engine power plants, because such enormous regular peak loads as in railway and lighting plants do not occur. The connected load can therefore be greater since the daily load factor, *i.e.*, the ratio of average load to maximum (peak) load, is smaller. With gas engines it is easier than with steam turbines—unless a large number of smaller turbo-generators are installed—to arrange for an adjustment of the power supply to suit the varying power demand of a steel mill, by operating the least number of engines at maximum load.

In the case of gas engines, the total plant load is divided into smaller units in the power house, so that gradual fluctuations of the use factor can be followed more closely without operating the engines at partial load. In other words, it is easier with gas engine plants to maintain economical operation in spite of reduced use factor.

Gas Blowing Engines

As far as the question of gas blowing engines versus steam blowing engines or turbo-blowers is concerned, it has been pointed out that it is desirable in a steel plant to obtain as much surplus gas as possible, to avoid firing of coal for raising steam. Since the gas engine uses only about one-half of the quantity of gas which would be required by steam blowing equipment, the advantage of using gas blowing engines in a modern blast furnace and steel plant is manifest. The service of furnishing wind for the blast furnaces and Bessemer converters is an ideal one for the gas engine.

While it must be admitted that some of the steam blowing equipment is not new, it will nevertheless be surprising to learn that the average total cost of blowing blast furnaces with gas blowing engines was 53.7 per cent, or a little more than one-half that with steam blowing engines, all charges except fixed charges included. The average heat consumption of the gas blowing engines in these five plants in 1912 was 30.5 per cent of that of the steam blowing engines, and the average thermal efficiencies of steam and gas blowing engines had the ratio of 1:3.27.

The average saving of five gas blowing engine plants over five steam blowing engine installations was $2.52 per blast unit (1,060,140 cubic feet of air at 15 pounds pressure). The importance of this saving will be more appreciated when it is stated that the total actual cost of blowing the eight Gary blast furnaces with gas blowing engines averaged, in 1912, only $3.26 per blast unit. Of this cost, 31 per cent, or $1.01, represents net operating expenses and 69 per cent, or $2.25, the cost of purified gas.

The values given in the various preceding tables give a fair idea of the labor cost in blast furnace gas engine plants. It will be noted that the labor cost per unit of power is not excessive compared with that of steam plants, if the boiler house labor is included in the latter.

Number of Employees

The number of men employed in blast furnace gas engine plants in this country is a good deal smaller than in Europe. This statement is borne out by the fact that the labor cost per kilowatt-hour in German plants is practically the same as in this country, whereas it is usually claimed that on account of lower wages and better skilled labor, this item should be materially lower abroad.

More or less trouble with gas engines was experienced in this country in the beginning, but it should be remembered that the experience of the past is not necessarily a forecast of the future. It would be foolish to look back on former unfavorable experiences so intensely that the view of the actual present and vision of the promising future is lost.

The gas engine in this country is of quite recent date. And it so happened that extraordinarily large orders for gas engines were placed with American gas engine manufacturers at a time when but little experience existed. American manufacturers did not, therefore, have as much time for the gradual development of the gas engine as their colleagues across the water. And thus it was unavoidable that difficulties, occasioned by structural weakness of certain engine parts, could not be overcome as promptly as would have been desirable from both the manufacturer's and the purchaser's standpoint.

IRON MINING NEWS

Cleveland-Cliffs Extensions

The Cleveland-Cliffs Iron Co. is preparing to open the Mackinac and Gardner mines in the Gwinn-Princeton district. A concrete shaft was sunk 100 feet to the ledge at each property more than two years ago, since which time no work has been done at either location. Power houses and other buildings are now in course of erection and the nucleus of a little town is springing up midway between the properties. Transmission lines extending from the Princeton mine, five miles distant, are being strung, the intention being to operate practically all of the machinery with electricity generated at the company's plant on the Carp river. Forty miles of wire in all will be put up, a work that will keep the linemen busy for two months. It will be the greater part of a year before ore is hoisted at either Mackinac or Gardner. The Princeton No. 2 mine recently was restored to the producing list, after having been idle since last fall. Except the Stegmiller property, which is operated by the Oliver Iron Mining Co., all the mines in the Gwinn district are controlled by the Cleveland-Cliffs Co.

Preparations to open another mine in the Negaunee field are in progress. This property, known as the Harvey lots, will also be developed by the Cleveland-Cliffs Co. The tract is directly north of the Lucky Star shaft, now being sunk by the Breitung interests. Each company is associated in the control of both properties and, under an agreement reached last year, one concern is to develop one of the two prospective mines and the other concern is to develop the other. There is no question about the value of either tract. Both have been thoroughly drilled and it is known that each one contains a deposit of high-grade ore lying, approximately, a thousand feet beneath the surface. Adjoining the Lucky Star at the south is the Prince of Wales mine of the Steel Corporation. The Cleveland-Cliffs Co. will erect a steel head-frame and a brick power house at the Harvey tract at the outset and will build other structures as they are needed. The shaft will go down in the footwall. As is now the case at practically all of the company's mines, the machinery will be electrically driven. The company is operating its crusher at the South Jackson property at Negaunee, a usual proceeding during the shipping season. Ore from the Cliffs Shafts mine at Ishpeming is being treated.

Frost Causes Trouble

Frost in stockpiles is causing trouble at various mines on the old iron ranges of Lake Superior. This is particularly the case at properties producing soft, wet ores and steam-shovel loading into cars is difficult, slow and expensive. Rarely, if ever, have conditions in this particular been more severe. Much work with picks is necessary and in many of the piles gads have to be used. The frost extends to the very base in some instances. Marquette range operators especially are experiencing trouble.

Bid on Large Stripping Job

Bids are being received by Charles E. Lawrence, superintendent of the Pickands-Mather interests at Crystal Falls, Mich., for stripping the Mastodon property, which is to become the largest open pit mine on the Menominee range. The stripping contemplates the removal of 1,500,000 cubic yards of earth, the average depth from surface to the ore being 90 feet. The maximum stripping will be close to 100 feet. Approximately the pit will be 1,200 feet long and 600 feet wide. For two weeks men and teams have been at work clearing the ground of timber. In conjunction with the stripping work, underground operations will be carried on and an exploration shaft afterward to be used for the transportation of timber and supplies will be put down, to be followed later by a working shaft through which much of the ore lying at depth will be taken out.

May Sell Low Grade Ore

Due largely to the presence of sulphur, there has been little demand for the ore mined at Corrigan, McKinney & Co.'s Great Western property at Crystal Falls, Menominee range, of late years. In fact, a big stockpile has not been touched for three seasons and the mine is closed down. Recently a consignment of 2,500 tons was loaded into cars and was sent on its way to a lower lake furnace. This ore is to be given a test in the stack and, if found satisfactory, it is understood the same pig iron-making interest is prepared to take practically the entire pile.

Richmond to Break Record

M. A. Hanna & Co.'s Richmond mine in the Cascade district will break its record this season with an outgo of 150,000 tons. Operations have been much facilitated by the installation of a second crusher. The property is an open pit, about 700 feet square. The ore is of low grade, averaging between 40 and 50 per cent in metallic iron and it is exceptionally hard. With the over-burden removed, holes are drilled into the ore and are blasted and the product thus broken is loaded by a steam shovel. Recently one mass estimated to weigh in excess of 140 tons was sent crashing into the pit. In this instance the holes were drilled to a depth of 30 feet and each was charged with more than 100 pounds of giant powder. The blast brought down more ore than ever before broken from the bed at one time. The Richmond at present is employing a force of 65 men. A considerable portion of the ore now being shipped is going to the Mayville, Wis., furnace. Last year's production was 120,000 tons.

Mesabi Shipments Heavy

As it is to be expected of a range that produces more than twice as much ore as all the other Lake Superior fields combined, the Mesabi is shipping on a tremendous scale, even though it has not yet struck its maximum gait for the season. Its outgo lately has been approximating 200,000 tons a day, of which the Great Northern has handled 37 per cent, the Duluth, Missabe & Northern 35 per cent and the Duluth & Iron Range 28 per cent. The expected production for the range this year is 35,000,000 tons. Excellent progress on the construction of the mammoth steel and concrete dock of the Missabe company at Duluth has been made to date. Operating five pile-drivers since the institution of the work in February, the contractors for the foundation of the pier proper and for the piling and concrete piers for the approach have completed their part of the undertaking. The dock itself is to be half a mile long, and the approach twice that length. For the foundation alone 15,000 wood piles and 5,000 steel-sheet piles were used. The dock will not go into commission until 1915. Its cost will not be far from $2,750,000. The American Bridge Co., contractor for the steel work, has made a good start with its operations.

THE IRON TRADE REVIEW

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The Best Way to Get the Facts

When a question is sincerely asked, it is with the purpose of obtaining information. Hence, although one may suspect political motives on the part of certain senators, the authors of the 29 questions relating to the tariff which are to be sent to manufacturers of the country are entitled to the presumption that they realize that they do not know everything about the tariff and are anxious to learn. The question is—is this method of asking questions the best plan for getting at the important facts necessary for the revision of the tariff? Our own opinion is that the senators will find great difficulty in obtaining answers to a number of the questions. For example, one of the paragraphs of the interrogatories is as follows:

"What was the cost of production in your plant per unit of your product for the fiscal years 1910 and 1912? Give cost of materials, labor, overhead charges and depreciation charges in separate items and in as much detail as possible. In this connection give capitalization, amount of common stock, preferred stock and amount of bonds issued; amount of actual cash or its equivalent in property received in consideration of stocks and bonds; rate of dividend paid on preferred stock and common stock and rate of interest borne by bonds for the past ten years. How much of your earnings for each of the years, 1910, 1911, 1912 have been credited to surplus and how much devoted to additions to the plant; salaries paid during each of the foregoing years to each of your principal officials; statement of assets and liabilities, 1910, 1911 and 1912, and comparative balance sheet for these years?"

Complete answers to the questions in this paragraph would give very valuable facts, and it is probable that the information could be obtained by a tariff board or commission, or even by the department of commerce, if the manufacturers were given assurance that their identity would not be disclosed and that the information would be held as confidential. If, however, all the facts about the cost of production, prices, earnings, salaries, and everything of importance connected with a plant are to be made public property, the manufacturers would naturally and properly resist being compelled to answer.

The obtaining of all proper information could, we believe, be safely entrusted to a tariff commission or board, and the present is an opportune time for the appearance of the third edition of the address delivered by Henry R. Towne, at the first tariff commission convention, in Indianapolis, in 1909, and afterward published under the title of "The Neutral Line". President John Candler Cobb, of the national tariff commission, in announcing the publication of this third edition, states that the clearness, directness and simplicity of the argument made by Mr. Towne have stood the test of intense discussion to a remarkable degree. In his introduction to the third edition, Mr. Towne says that no one who intelligently comprehends the subject suggests that the pending bill should be held up and action on it postponed until a tariff commission can be created. Mr. Towne adds that, on the contrary, men of all parties and all interests unite in conceding that the downward revision of the tariff, which was decreed by the country in the election of 1912, should be accomplished as quickly as possible, so that the uncertainty which now prevails may be terminated and that business may proceed to adjust itself to the new conditions. Mr. Towne urges, however, that immediately following the passage of the pending tariff act, legislation should be enacted creating a permanent governmental body to commence the work of compiling and maintaining a fund of statistical and technical information which would hereafter be available to congress when framing or amending tariff legislation.

We believe that this position is sound and will commend itself to the country. As Prof. Henry C. Emery, former chairman of the tariff board, recently pointed out, the foreign system provides for a permanent staff of trained experts in the different departments of the government, who make a life study of the problems involved in tariff legislation and acquire knowledge of the industrial conditions of all the great nations. This information is constantly at the service of the government. The government officials are free from the influence of local business and from all political bias. With such a body as this collecting facts, Congress would avoid many of the inconsistencies and blunders which have

characterized every tariff bill which has been passed in this country since the foundation of the government. Incalculable losses would be avoided and much suffering would be prevented. We trust the present administration will see its way clear to endorse some method of thorough and systematic investigation of industrial conditions.

Not Cheapness, But Certainty Most Important

Mr. Daniels, the distinguished journalist, who now presides over the navy department, has decided to take his turn at a discussion which has broken out at intervals during past years concerning the awarding of contracts for armor plate. There seems to be no serious disagreement as to the facts, for letters by armor plate manufacturers published by Mr. Daniels frankly state that it has been the policy of the government not to award contracts for armor plate and gun metal to any company, but on the contrary, the government pursues the policy of dividing orders among various manufacturers. "The practice of dividing orders for forgings for guns," says President Grace, of the Bethlehem Steel Co., in his letter to Secretary Daniels, "has caused the firms that usually compete for such contracts to understand that each will receive only a portion of the work contemplated and that the department will be willing to pay for the material a price equal to the lowest price theretofore paid. Each firm knows that it could not secure all of the work by offering to do it at a lower price. The natural result of this condition of things is that the price which the department has paid for gun steel has come to be recognized as the market price."

Secretary Daniels says that if we are going to subsidize companies so as to have advantage of their armor plants in case of war, it should be honestly done and without concealment or attempt at hypocritical evasion by congress to force competition. "If, on the other hand, we are going to honestly award our contracts to the lowest bidder, let us do so," says the secretary. He expresses the opinion that the effect of so awarding to the lowest bidders would be possibly to encourage real competition among the companies, but he does not seem to be very confident on this point. Owing to the very great problems connected with the manufacture of armor plate and other materials for use in warfare, it may seriously be doubted whether it is possible or desirable to obtain competition. The most important thing is to be sure that, in the event of war, the country would be able to obtain the materials of war.

"If," says the secretary, "our object is to get armor plate as cheaply as possible and to get out of the difficulties of the present situation, I shall certainly be disposed to recommend the establishment of an armor plate factory by the government of its own." The proposition is not likely to meet with serious consideration. The American people are not anxious to obtain armor plate as cheaply as possible. They are anxious, however, to obtain the very best armor plate in the world at a reasonable price. The activity of the government ought to be limited to seeing that this is accomplished.

Pig Iron at Cost

With the continued declines of the past few months, the pig iron market has lost almost precisely one-half of the advance it experienced last year, and the question uppermost in the minds of both producers and consumers is whether it will now proceed to lose the other half.

The low point which marked the opening of 1912 was an extremely low one. Except for a short period in 1904, and for a period from about the middle of 1892 to the early part of 1899, it was the lowest in the entire history of the American iron industry. In the depression of the nineties, all costs were extremely low, and, making allowances for that fact, the pig iron market at the beginning of 1912 was relatively the lowest, except for a portion of the year 1904.

A comparison of conditions at the beginning of 1912 and at the present time does not suggest that it is possible for the pig iron market to reach its former low level. Furnace men are a unit in pointing out that labor, ore and coke costs are higher, to the extent of fully $2 per ton of pig iron, and pig iron is now not more than an average of $2 a ton higher. Southern iron is $1.50 higher, No. 2X at Philadelphia is $1.75 higher, Buffalo is $1.50 higher, Cleveland is $2 higher, Chicago is $1.50 higher, while in the valley market foundry iron is $1.50 higher, basic $2.25 higher and Bessemer $2.75 higher.

An important fact to be considered in instituting a comparison between January, 1912, and the present time is that a much larger productive capacity is in operation. Our monthly furnace reports have shown that in January, 1912, the average daily production by merchant stacks was 18,000 tons daily, while last month the average was 25,400 tons daily, an increase of 41 per cent. In general, production at a given time is by the fittest furnaces, those having the lowest production costs. The additional 40 per cent now in blast may be taken to the furnaces less positioned than those which made the market in January, 1912, and even some of those furnaces were believed to be suffering losses, running up to $1 a ton. Irrespective, therefore, of the advanced costs applicable to all furnaces, it would apparently require the elimination of many furnaces now active to put the industry on the former basis. Inasmuch as demand is much heavier now, shown by the operation of the furnaces with the accumulation of relatively little stocks, the excess furnaces could not blow out without causing a shortage and consequent market reaction.

Gary's Optimistic Sentiments Applauded

At the Meeting of the American Iron and Steel Institute

Effect of Foreign Wars—Legislative Tinkering—Proposed Method of Taxing a Few Opposed—Railroads Entitled to Higher Rate—Next Meeting Will Be Held in Chicago

Judge Gary on Majesty and Humanity of the Law

Not long since I was crossing the street at a corner where the traffic was very heavy. The street was wide and many rapidly-moving automobiles were passing to and fro, so that the danger to a pedestrian was considerable; and I noticed in the center of the street a big policeman and in front of him, almost in his arms, was a little boy, about seven or eight years old, on roller skates, who had been trying to make his way down the street. He had become somewhat confused by the numerous automobiles and was in danger of being run down. And this big policeman, seeing the situation, caught the young lad in his arms and held him there until the vehicles had passed out of the way and then the little lad was allowed to cross the street and get to the sidewalk safe and sound. This was an illustration of the majesty and the humanity of the law.

And so I would urge upon you, gentlemen, today, however weak or strong, however great our difficulties, whatever the controversies may be in the discussion of the topics of the day, after all, in the long run, the courts will see that substantial justice is done to all of us, rich or poor, strong or weak. And more than that, no man should ask, and that everyone has the right to demand.

When Judge Gary spoke as above quoted in opening the fourth annual meeting of the American Iron and Steel Institute at New York City May 23, the room rang with the applause of the several hundred assembled members. The patriotic yet resolute tone of their president's address found immediate approval in the minds of those who represented on this occasion the American iron and steel industry. Faith in ultimate justice and optimism as to their business were the dominating sentiments of this very successful meeting. "Opportunity for success was never better. Optimism is still fashionable," said President Gary.

Large Attendance

The meeting of the Institute, which was very largely attended, was held at the Waldorf-Astoria. The number of members present at the various sessions was between two and three hundred. At the banquet Friday evening the diners numbered about 350. The meeting was the largest ever held by the Institute at New York, and in point of size rivaled the gathering at Pittsburgh last fall. The morning and afternoon sessions on Friday were given over to the presentation of papers and discussions of topics pertaining to the raw materials and their transportation, to a man who is elected to office, being the processes of manufacture and to commercial questions of the iron and steel industry. Welfare work came in for a generous attention at the meeting.

Judge Gary's Address

Judge Gary, in his opening address, spoke as follows:

"Business conditions at the present time are not as good as we would like to have them. I suppose we would be less than frank if we failed to admit that there has been considerable recession in our business. Possibly this applies to business conditions generally throughout the country. I suppose there are many reasons for this, and I do not think it is a mistake to refer to these questions, because when we know what conditions are, and especially if we know their causes, we are better prepared to protect ourselves against any great loss or damage to our affairs by reason of those conditions.

"Of course, there are financial conditions throughout the world at the present time that have some effect upon our business, indirectly if not directly. It is impossible to have wars in any country that do not have their influence upon all other countries. It is impossible to destroy property of large value without producing an unfavorable general result throughout the world. I suppose the European wars have directly and materially, perhaps, though I hope temporarily, affected the general financial conditions and markets of the world. There is no doubt Europe has been drawing from this country large sums of money to finance the losses which have been sustained in these pending difficulties in Europe; and not only that, the different countries of Europe have been preparing themselves for war, believing there was a possibility of a general conflict. And in doing this, of course, it has been necessary to secure all the ready money that was available. And I have no doubt considerable money has been taken from this country for these purposes. And, therefore, there is a slight stringency in the money market in this country which has been felt in some degree. This is about as bad a picture of the conditions as I can present.

"Fortunately the wars are ended. The nations which have not been directly connected with this warfare have so prepared themselves for future conflict that they are almost certain to prevent war. In other words, they have secured peace by great diplomacy and by the expenditure of large sums of money. And not only that, the fighting nations which have been engaged in this terrible conflict have secured peace, although they had to fight for it.

Legislative Tinkering

"I think perhaps worse than the conditions I have alluded to at the present time, certainly so far as applies to this country, is the disposition of legislative bodies to tinker with questions they are not very well prepared to discuss or to decide. It is most unfortunate that

the average man, or a little below it in some places, has the impression that there is elected into him by the people considerable knowledge which he did not before possess. You gentlemen know by experience that if in the country a farmer or a blacksmith is elected justice of the peace, the people generally, and particularly the official, are of the opinion that there has been elected into the head of this justice of the peace considerable knowledge, and the next day the neighbors all run to him for legal advice. And that is about the situation with reference to a good many of our officials.

"There are pending at the present time in various places questions of legislation which are more or less important, and which may result in temporary injury to our business. I regard as the most dangerous at the present time the disposition of legislative bodies to pass laws which are calculated to produce classes. The man who is in politics, the politician as distinguished from the statesman, seems to consider first of all the question as to how he can secure more votes for himself—first, how he can get into office, and secondly, how he can keep in office. And the disposition of some is to appeal to classes by way of stirring up animosities and for the purpose of arraying what he considers to be the multitude of men against the few with the idea of stirring up such a feeling of prejudice as to divide the different classes of people into factions and thereby perhaps secure a majority of votes in order to get in or to keep in office. To my mind, this is a very serious question.

Income Tax

"I think, for instance, the proposition to assess the incomes of men who have incomes of more than $4,000 and exempting the incomes of those who receive less than $4,000 per annum is one of the worst things that has ever happened in this country, because it immediately arrays 97 per cent of the people against 3 per cent of the people. I have no objection to an income tax when and as needed. I believe a man able to pay ought to pay. And I believe in a liberal taxation all the time, and in most liberal expenditures of money for the benefit of all the people. I have nothing to say against an income tax as a principle. But to make 97 per cent of the people interested in favor of an income tax which exempts them and which compels the 3 per cent to pay these large sums of money is a very great mistake, and it is an innovation in this country, to my mind. I cannot look upon it except as the beginning of forcible distribution of wealth, however honestly acquired.

"Now the reason I speak of this, and the only reason, is that it seems to me the influence of a body of men so prominent as you should be against legislation or action of this kind. It is so unjust and so unfair and so contrary to the institutions of this country that we should prevent its adoption, if possible, and make it unpopular, if adopted.

"I have not any doubt that at the present time there is a disposition on the part of some of the leading financiers of the country, and perhaps those whose influence is needed to carry on the best interests of the country, to withdraw their financial support from extensions of various kinds, and that we are feeling the effect to some extent.

"Of course, in these remarks I am talking, so to speak, to my own family; trying, as I said, to present the worst feature, for the purpose of considering at least, each for himself, what ought to be done and what can be done. On the other hand, we have at the present time before us the possibility, and I think the probability, of action by one department of government, the Interstate Commerce Commission, which is calculated to produce very good results. I believe the railroad companies will secure the right to advance their rates 5 per cent. From the standpoint of a shipper and from the standpoint of one who is selfish, I do not like to have any business I am connected with pay any larger rates than are necessary, but I cannot help feeling that the railroads are justly entitled to an increase in rates. And when we find a thing is fair and just, it seems to me we ought to advocate it. And if the railroads do get this increase of rates at the present time, as some of us at least expect, I believe they will begin to buy very liberally of our products, and that will have a very decided effect in our business.

"There is another thing that I think the steel men should be particularly pleased with, and that is the attitude generally of our workingmen. I should like to ask you men who have been so much longer engaged in this business than I have whether you have ever known a time when, generally speaking, the workingmen at the furnaces and the steel works have had a better feeling, a more kindly feeling, toward their employers than they have at the present time. Notwithstanding the agitation to which I have referred, the disposition of the law makers to appeal to the masses, the efforts which have been made by some of the leading labor agitators, whose names I will not mention, the workingmen generally have been unmoved, uninfluenced and not disposed to antagonize the employers. I think that is one of the best signs of the times. I think, if this continues, we may hope for a conservative force which will stand shoulder to shoulder with men like you who are endeavoring to promote the best interests of the country and who will have a lasting and beneficial influence.

Sees Prosperity

"The fundamental conditions of this country, to my mind, were never better. It is the richest country in the world. The wealth of the country is rapidly increasing; the prospects for crops for the coming year were never better than they are now; and there is every reason why, if the country were allowed to prosper, it should advance further and faster day by day than ever before.

"So I hope, gentlemen, that we will not lose courage, that we will keep our heads, that we will have in mind that recession in business is not justified by the fundamentals, that it is only a question of time when we may expect improvements. It remains for us to determine whether or not in the steel industry there is going to be a continued depression or an increasing depression. Let us look the facts squarely in the face and let us remember all the time that opportunity for success was never better, that optimism in the country is still fashionable. It is very easy for us to become demoralized, to become sus-

Institute Wants Publicity

At the opening of the afternoon session, President James M. Campbell, of the Youngstown Sheet & Tube Co., presented a motion which unanimously prevailed, that representatives of the daily press be admitted to the sessions. Some reporters who had appeared at the morning session were not admitted because of the lack of official sanction. Mr. Campbell's resolution puts the Institute upon record as desirous of giving the daily press full access to its deliberations. This, in the minds of many prominent members, is the proper course to pursue to avoid any misapprehension upon the part of the general public, and to show the sincerity of the position of the Institute that its purposes and discussions should be given and are intended for the broadest dissemination. At the evening's banquet, a number of the representatives of the press were present.

picious of one another, to look for clouds in the horizon; it is very natural to borrow trouble, and if we get ourselves in the right condition, we influence our subordinates in office, we influence our customers more or less, and when the structure called prosperity begins to crumble it is very easy for it to fall."

Schwab's Description

"I wish some of you could have heard in court a few days since the testimony of Mr. Schwab in referring to old conditions in the iron and steel industry as compared with the conditions of today. We have taken a new departure; we have left the old lanes; we have abandoned the old habits; we are dealing in confidence one with the other; we are looking farther ahead than we used to. When prices go off 1 per cent we do not immediately run out into the market and put our prices down 10 per cent in order to see if we cannot get ahead of our neighbor and make 5 or 6 cents for ourselves, even though we may lose $5 or $6 within a week by doing it. The iron and steel industry is in the hands of men now who have the ability and the courage to stand by their guns and to refuse to be stampeded by circumstances and conditions and inflammatory speeches which in olden times were calculated to bring about demoralization and distrust.

"And in my opinion it is one of the most pleasant things about the Iron and Steel Institute that while we have not yet reached the plane of activities which we know we will reach and which is certain to bring about greater success than ever before experienced, yet we are making great progress, and we have connected with the institute men whose influence not only in their own lines of industry but in all the activities of business life are potential. So, gentlemen, I say, let us be proud of our position and let us be satisfied that we know what we are doing, and that no legislative body, no inflammatory periodical or speeches can have any influence upon us in standing together and pushing forward in a proper and rightful way our best interests.

The Courts

"The great protection for all of us and for all of our interests, in my judgment, is found in the courts of this country.

"I would impress just one thought upon the minds particularly of the younger men here. Let us never get away from the courts. Let us make it certain we ourselves are doing about the right thing; that no member of this institute shall justly be accused of intentionally antagonizing or violating the laws of the country, because all of us must finally appeal to them for protection. We have the right to discuss openly the questions which are pending in the congress of the United States or in any other legislative body, we have the right even to criticise the law after it has been passed and to insist that it ought to be modified or repealed. But when any proposition once becomes a law, and until that law is repealed or changed, while it is the law of the land, let us, members of this institute, always stand by the law and do everything we can to see that it is fairly and justly and fully administered.

"The president of the United States recently said that honest business need not be afraid. Well, let us be honest. Let us take him at his word. Let us assume he means exactly what he says. So far as we are concerned, let us do the right thing, the fair thing and the just thing by everyone we come in contact with and all who are interested in our deliberations and in our decisions."

Work of the Institute

Judge Gary read before the meeting a memorandum prepared by Secretary James T. McCleary, which covered the scope of the institute's work and progress during the past year. This report was as follows:

"Since the institute assembled in this room a year ago, the membership has more than doubled, increasing from 435 to 872. A year ago, James M. Swank, for 40 years the secretary of the American Iron and Steel Association, resigned, to take effect on Dec. 31, 1912. With the retirement of Mr. Swank, the association went out of existence. Immediately thereafter, on Jan. 1, 1913, its work was taken over by the American Iron and Steel Institute. The offices of the association in Philadelphia were retained for the time being, and all of Mr. Swank's statistical staff was continued in service. The Philadelphia office has gotten out this year four special statistical bulletins, covering respectively the production in the United States during 1912 of all kinds of pig iron, all kinds of rails, pig iron production by grades, and production of iron and steel structural shapes, wire rods, and cut and wire nails. The annual statistical report is approaching completion, and a new directory of iron and steel works is under way.

"The New York office began in January last the publication of a monthly bulletin which has attracted attention in this country and in Europe. Its total circulation averages 7,500 each month, running sometimes as high as 9,000. The bulletin serves as a medium of communication between the institute and its members, and gives to a large number of outside readers information as to the work of the institute.

The Year Book

"Early this year, the institute published its year book for 1912, giving the proceedings of the two general meetings of the institute held last year. At the close of this meeting, its proceedings will be sent out to the members in pamphlet form, and after the October meeting the year book for 1913 will be issued, giving the proceedings of both of the meetings held this year.

"On Jan. 3, 1913, the directors of the institute adopted as the universal danger sign the red disc that had for some time been used as such by the United States Steel Corporation and some other companies, recommending it for use in all iron and steel plants. The universal danger sign has been adopted by the National Association of Manufacturers and by other industries and associations outside of iron and steel.

"The secretary and the assistant secretary of the institute and the secretary of the welfare committee have made over 50 visits to iron mines and steel plants, to counsel and advise on safety and sanitation, and other matters in which the institute is interested. They have also delivered more than 75 addresses before business bodies, colleges, schools, churches; have consulted with public health authorities and made many studies of social and hygienic questions and general welfare."

The Day's Program

At the morning session, Heinrich J. Freyn, of the Allis-Chalmers Co., Milwaukee, presented the paper on "Gas Engines", which was discussed by Arthur West, of the Bethlehem Steel Co., and by Richard H. Rice, of the General Electric Co., New York. George A. St. Clair, of Duluth, gave a paper on "Ore Reserves in the Eastern Mesaba Range", which was illustrated. Sheldon Norton, of Witherbee, Sherman & Co., Mineville, N. Y., discussed the paper. The other paper of the morning was "Importance of First Aid to the Injured", by Wm. O'Neill Sherman, chief surgeon of the Carnegie Steel Co., which was discussed by Dr. John B. Lowman,

chief surgeon of the Cambria Steel Co. Between the morning and afternoon sessions, a buffet luncheon was served. The papers of the afternoon included "By-product Coke Ovens", by Carl A. Meissner, chairman coke committee United States Steel Corporation, discussed by Wm. H. Blauvelt, consulting engineer Sement-Solvay Co., Syracuse, N. Y., and by C. G. Atwater, American Coal Products Co., New York; "Claims and Their Adjustment", by Geo. P. Early, special agent American Sheet & Tin Plate Co., Pittsburgh; "The Practical Value of the Microscope in the Iron and Steel Industry", by Albert Sauveur, professor of metallurgy and metallography, Harvard University, discussed by Bradley Stoughton, of New York, and by John S. Unger, manager research laboratory Carnegie Steel Co., Duquesne, Pa.; "Transportation of the Great Lakes", by Harry Coulby, president Pittsburgh Steamship Co., Cleveland; and "What Causes Fatigue", by Dr. Thomas Darlington, secretary welfare committee, American Iron and Steel Institute.

Mr. Freyn's paper is published in this issue of THE IRON TRADE REVIEW. Other papers will be published in later issues.

Future Ore Transportation

Dealing with the important lake transportation of iron ore and glancing hastily into the future, President H. Coulby, of the Pittsburgh Steamship Co., the lake arm of the Steel Corporation, in his paper graphically illustrated the growth of lake commerce by comparing the tonnage moved in 1901, the year of the organization of the Steel Corporation, with that of 1912. In 1901 the total iron ore movement on the lakes was 20,157,000 gross tons; in 1912 it was 47,435,000 gross tons, adding:

"The percentage of the Steel Corporation movement to the total movement was nearly 10 per cent less in 1912 than in 1901, demonstrating very clearly that, even with the large expenditures made by the Steel Corporation at Gary and other plants, the other consuming interests of lake ore have grown more rapidly than the Steel Corporation."

In 1901 the average lake freight on iron ore from the head of Lake Superior to Lake Erie ports was 80 cents per gross ton; in 1912 it was 50 cents per gross ton. In 1901 the largest single cargo carried was 8,222 tons; in 1912, the record was made by the steamship Col. J. M. Schoonmaker, 13,511 tons. In 1901 the total value of freight moved through the Soo was estimated at $298,000,000, against $791,000,000 in 1912. It is estimated the movement of ore this year will exceed 50,000,000 gross tons, or a 150 per cent increase over the movement of 1901. The season of navigation on the lakes does not exceed an average of 240 days, or about 200 working days at the loading and unloading docks. This will require 250,000 tons of ore to be handled every working day in and out of the ships during the season of navigation.

As to the future of lake ore transportation, President Coulby said:

"Estimates have been made of the amount of ore that is available in the Lake Superior district; but with new developments each year and the necessity of using the leaner ores, I do not believe there is any man living who can make an estimate that is worth anything of the available tonnage of ore that will eventually be brought down from the Lake Superior district before the ore bodies are exhausted. * * * I believe that the growth of lake commerce will be just as great during the next 25 years as it has been in the past."

Judge Gary presided at the banquet, Friday evening. Prof. Frederick Crabtree, of the Carnegie Technical Institute, Pittsburgh, spoke upon the topic "In What Direction is Education Tending in the Training of Men for the Technical Profession"? This topic was discussed by John McLeod, assistant to the president of the Carnegie Steel Co., Pittsburgh, and by Henry M. Howe, of New York City. Impromptu remarks were then called for from among the diners. Those who spoke were Charles M. Schwab, James A. Farrell, Joseph G. Butler Jr., and James H. Hoyt. Mr. Schwab spoke in a particularly happy vein. At the suggestion of Mr. Butler, a toast was drunk to the late J. Pierpont Morgan, whom Mr. Butler styled as "the greatest man in the nineteenth century".

Will Meet in Chicago

At a business meeting of the directors of the institute held in connection with the general meeting, it was voted to hold the fall session in Chicago. The date will probably be Oct. 24. The present officers were re-elected by the directors for the ensuing year. These are as follows: Elbert H. Gary, president; Powell Stackhouse, first vice president; Willis L. King, second vice president; Charles M. Schwab, third vice president; Edward Bailey, treasurer, and James T. McCleary, secretary. Seven new names were added to the membership roll. These were as follows:

Eaton, Clark D., New York City, eastern sales agent American Car & Foundry Co.

Farrell, William H., Bridgeport, Conn., president Bridgeport Screw Co.

Mackenzie, George C., Ottawa, Can., chief engineer ore dressing and metallurgical division, mines branch, department of mines, Ottawa, Can.

Rice, Richard H., New York City, engineer General Electric Co.

Roby, Luther A., Cleveland, superintendent steel department Wellman-Seaver-Morgan Co.

Ward, James H., New York City, assistant to chairman Bethlehem Steel Corp.

Wells, Robert G., Hamilton, Ont., manager Hamilton works, Steel Co. of Canada.

Adds to Plant

The American Malleables Co., malleable iron castings, Lancaster, N. Y., has made the following improvements and additions to its plant: Brick walls substituted for frame; a 40-foot bay of steel over each of the four melting furnaces and a 65-foot brick and steel addition at the end of the foundry. Other changes in the foundry include dismantling of cupola buildings and cupolas, tearing out old core room, giving the 25 x 150 feet space to the foundry. A new core room built has accommodation for 100 coremakers and has three batteries of rolling drawer type ovens, erected by the J. D. Smith Foundry Supply Co. The core shop is of steel and brick with a monitor roof and a concrete floor. A Blystone sand mixer supplies the core sand.

A low pressure heating system has been installed and a new transformer house with transformers of 150-kilowatt-ampere capacity each. An Ingersoll-Rand two-stage, 888-foot air compressor will take care of the increased compressed air needed.

Two New Haven sand blast mills and one Sly sand blast barrel have been installed in the cleaning departments, with seven steel shell tumblers made by the W. W. Sly Co., Cleveland. Dust arrester systems in both the soft and hard cleaning departments have been installed by the Cleveland Nipple Works.

The company also is building a new office at the end of its recently completed shipping building.

Damages Awarded.—A jury in the federal court at Chattanooga, Tenn., heard evidence in the case of T. S. Fortner, of Ducktown, Tenn., against the Ducktown Sulphur, Copper & Iron Co., which was sued for $25,000 damages because of damage to vegetation and other property from fumes given off by the company's plant. The jury found for the plaintiff, but reduced the amount of damages considerably, $7,500 being the amount of the judgment.

Pig Iron and Ferro May Be Put On Free List

Underwood Tariff Bill Will Have a Rocky Road to Travel in the Senate—Questions Which Will Be Sent to Manufacturers

Washington, May 27.—With the end today of hearings before the sub-committees of the senate finance committee, all oral protests against the Underwood tariff bill made by manufacturers of the country have been received. A list of 29 questions has been prepared by the majority members, who included the 16 original ones by Senator LaFollette, and will be sent to manufacturers. Answers, to be made under oath, must be filed before the bill goes to the senate, or the briefs and arguments will not be printed.

Rough sailing is in store for the bill. Whether the administration and Democratic leaders will be able to pilot the bill through the course they have laid out, is an open question. Champions taking either position can be found in plentiful numbers. The principal schedules, of course, which will be the objective for earnest struggle, are those dealing with wool and sugar. Open revolt has been declared long ago and is being pressed daily by Senators Ransdell and Thornton, of Louisiana, while Senator Walsh, of Montana, has developed a not unexpected out-and-out opposition to the program on these schedules. In addition to these, Senators Newlands, Thomas and Shafroth show signs of following their footsteps. Presidential influence may be required to quell the threatened spread of the rebellion or the administration will come on the verge of meeting defeat in carrying out the president's proposals regarding these two items. It would necessitate the vote of the vice president to sustain him, counting on Senator Poindexter, Progressive, as voting for the Democratic measure.

But before the bill gets to the senate it is doomed to be the object of much attack. Disposal of it before the full senate finance committee, being only a formal proceeding, will be of short duration, followed by discussion before the Democratic caucus. Here is expected to be extremely interesting debate. This, along with other obstacles, has convinced the majority members of the committee that the bill will not reach the senate before June 10. It is a foregone conclusion that Republicans will offer a huge number of amendments, and practically each paragraph will be fought by them, according to reports, and indicated by statements on the floor by such a prominent Republican leader as Senator Penrose. One senator has said he would not be surprised if the bill did not pass before December 1. His statement is considered unusually skeptical, but it is held to be well within the range of possibilities.

Numerous protests against the income tax amendment have yielded nothing, judging from statements of Democratic leaders, who say no changes are to be made by the senate finance committee or Democratic caucus.

Pig Iron on Free List?

Nothing has developed the past week to indicate that the metal schedule is to be slashed throughout, as had been rumored and published. Senator Stone's statement that no general reduction is contemplated holds good, according to all outward appearances at least. The sub-committee is said to have voted to put ferro-manganese and pig iron on the free list. This action would not be unexpected. Indeed, it has been repeatedly reported that ferro-manganese was to be made duty free, although one report said it would be continued at the present duty of $2.50 per ton and another had it that it would be cut to $2. Recently it has been stated pig iron would be put on the free list, a plan which the house ways and means committee had under contemplation, according to reports, and if it is made free, the action of the sub-committee would not be surprising. The Underwood bill now proposes an 8 per cent duty, as compared with the present levy of $2.50 per ton.

Criticism is made of the majority members of the senate finance committee for submitting at this late hour its list of questions to manufacturers of the country. It is held that the inquiry cannot play any part in the construction of the bill. The quiz is declared by Republicans to be only an attempt at appeasing the minority in its demand for public hearings, and they contend that at the most for the immediate time it is merely a perfunctory proceeding. It is questionable in the minds of many whether manufacturers will respond in any appreciable degree to the queries. Should they take the position also that it is too late to accomplish results through this source, they may naturally refuse to heed the questions on the ground that the information is desired from them for later use should the new law result in the wage question becoming a pointed issue. Tremendous work would be required to tabulate, digest, apply and act on the new testimony if any general response were made. Then it would be followed by differences with the house, making impossible a passage of the bill by August 1, the date Democratic leaders have indicated.

Preliminary questions deal with the manufacturer's identity, the commodity produced, the raw materials used in production, whether they are produced here or abroad, and, if imported, from where; cost per unit of raw material, and cost per unit of similar product in foreign countries.

Some of the other questions follow:

"What part of your production do you export? To what countries and in what quantities and values, and what rates of duty are paid at the several foreign ports?

"What were the wholesale prices charged by you and by any concern in which you are interested for this commodity in the domestic market, and what were the prices charged when sold in foreign markets during January, April, July, October, 1912, and January, 1913?

"What country or countries are your chief competitors in the foreign market to which you export?

"Is there a tariff differential for or against you in any of the countries to which you export this commodity? If so, what is the amount of such differential? What rates of duty have you paid?

"Is there any difference in the prices charged for this product in the domestic market by the independent producer and the trust producer?

"What were your wholesale prices f. o. b. factory of this commodity sold in the United States during January, April, July and October, 1912, and in January, 1913?

"What were your wholesale prices of this commodity f. o. b. factory for export in foreign countries during the same periods?

"What was the cost of production in your plant per unit of your product for the fiscal years 1910 and 1912?

"What part of the duty under the Payne-Aldrich law represents your profit as a manufacturer?

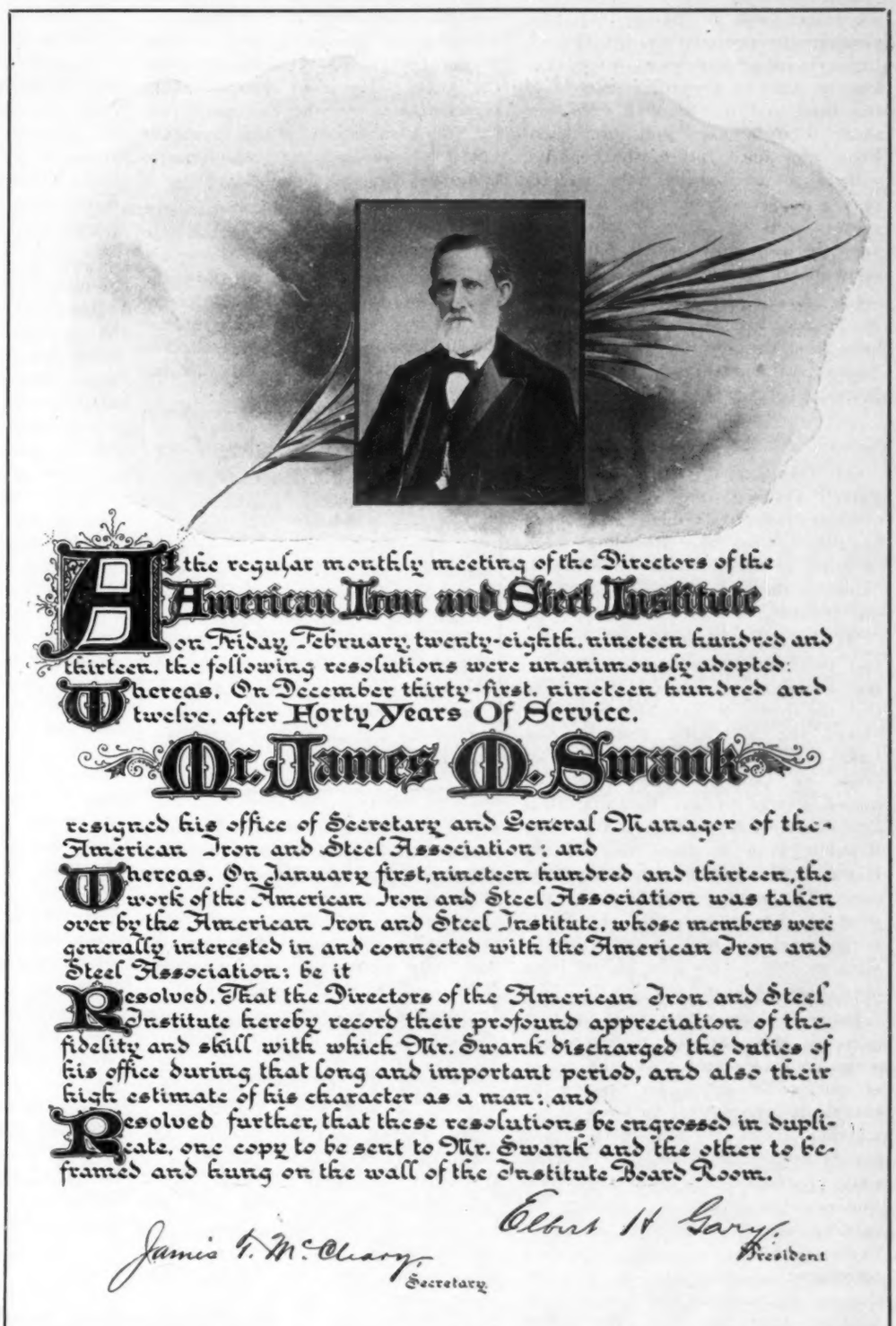
"Have you pecuniary interest in the maintenance of a high tariff on this commodity?"

TRIBUTE TO SWANK

Adopted by the American Iron and Steel Institute.

In appreciation of his long and distinguished labors for the best interests of the American iron and steel industry, James M. Swank, for 40 years secretary and general manager of the American Iron and Steel Association, was recently honored by a set of laudatory resolutions adopted by the directors of the American Iron and Steel Institute. The copy of these resolutions to be presented to Mr. Swank has been handsomely engrossed in colors upon parchment, and has been bound in the form of a book. This volume is bound in full morocco leather with silk lining. The signatures of all the directors and the officers of the Institute are being affixed to the document and the presentation of the volume will be made soon.

Parchment copies of the resolutions engrossed in colors, surmounted by an engraving of Mr. Swank, have also been prepared. These have been mounted on heavy cardboard for framing purposes. A copy of this form of resolution, handsomely framed, now hangs upon the walls of the directors' room in the American Iron and Steel Institute headquarters at 30 Church street, New York City. In the accompanying illustration appears a reproduction of this parchment.


At the regular monthly meeting of the Directors of the
American Iron and Steel Institute
on Friday, February twenty-eighth, nineteen hundred and thirteen, the following resolutions were unanimously adopted:
Whereas, On December thirty-first, nineteen hundred and twelve, after Forty Years Of Service,
Mr. James M. Swank
resigned his office of Secretary and General Manager of the American Iron and Steel Association; and
Whereas, On January first, nineteen hundred and thirteen, the work of the American Iron and Steel Association was taken over by the American Iron and Steel Institute, whose members were generally interested in and connected with the American Iron and Steel Association; be it
Resolved, That the Directors of the American Iron and Steel Institute hereby record their profound appreciation of the fidelity and skill with which Mr. Swank discharged the duties of his office during that long and important period, and also their high estimate of his character as a man; and
Resolved further, that these resolutions be engrossed in duplicate, one copy to be sent to Mr. Swank and the other to be framed and hung on the wall of the Institute Board Room.
Elbert H Gary
President
James A. McClary
Secretary

Bounty on Lead.—The house of commons at Ottawa, Ont., last week passed a bill to continue the bounty on lead produced in Canada till 1918. The bill reduces the annual amount to $100,000 instead of $250,000, but the bounty is being continued to enable Canadian lead smelters to meet the competition of American-protected lead, it was explained.

To Extend American Trade

J. Chaleyer, senior partner of J. Chaleyer & Co., Melbourne, Australia, is now en route to the United States, and will be in New York about June 10. The main object of his journey is to endeavor to arrange for direct representations and agencies of American manufacturers willing to cater to the Australian trade and desirous of being put into direct contact with the Australian wholesale buyers, through the offices of sole selling agents. Mr. Chaleyer may be addressed at the New York office of THE IRON TRADE REVIEW, 90 West street.

The report of the International Harvester Co. for the year ended Dec. 31, 1912, shows total revenue $126,518,238.

Farrell Says Corporation Prices Were Not Secret

Concessions Made to Large Customers—Judge Dickinson Objects to Statistics—Hearings Will Continue Until July 1

The hearings of witnesses for the defense in the United States Steel Corporation dissolution suit, according to present plans, will continue until July 1. On that date, the summer adjournment will be taken, the proceedings to recommence on Oct. 1. Counsel for the defense intends to lose no time in preparing its side of the case, and to that end very few short adjournments will be taken. From now until July 1, the hearings will be interrupted by only one recess, a week early in June, when inventory will be taken of the large mass of testimony which will have accumulated by that time.

Last week's witnesses were Charles M. Schwab, president of the Bethlehem Steel Corporation, and President James A. Farrell, of the United States Steel Corporation.

Farrell Resumes Stand

On Thursday, President James A. Farrell resumed the stand for his cross-examination, which had been postponed from the preceding week in order to accommodate Charles M. Schwab, who had made plans for going abroad.

Mr. Farrell said he wanted to correct two statements made in his direct examination. One of these was that the Jones & Laughlin Steel Co. owned the Mahoning mine in the Lake Superior district. This was an error, he said, as that mine was owned jointly by the Cambria Steel Co., Andrews & Hitchcock Iron Co., Republic Iron & Steel Co., M. A. Hanna & Co. and the Steel Corporation. The second statement he desired to correct was that the Pittsburgh Steel Co. built its open-hearth plant in 1901. This date should have been 1908, he said.

Judge Dickinson first took up that part of Mr. Farrell's testimony in which he had stated that "the prices of our commodities are known to everybody who desires to know them, whether they are customers, trade papers or anybody else." Mr. Farrell today reiterated this statement. He said there never was any secrecy regarding any of the Steel Corporation's contracts. Judge Dickinson mentioned a contract for a large amount of material which was made with the Harriman lines. He wanted to know if this contract wasn't "a secret agreement and based on a preferential rate". He also asked the same question in regard to contracts between the American Can Co. and the American Sheet & Tin Plate Co., whereby the former agreed to take 99 per cent of its requirements from the latter. He also inquired about contracts whereby the National Transit Co., a subsidiary of the Standard Oil Co., obtained its requirements from the National Tube Co.

"There was nothing secret about these contracts," said Mr. Farrell. He did not remember whether or not they had been announced to the trade papers, but he said such announcements would not have been against the policy of the Corporation. He could not recall at what definite prices these large contracts had been made, but, he said, it was the Corporation's practice, as well as that of all large concerns, to charge large customers a little lower price than the smaller customers. This, he said, was fully known in the trade and there was nothing secret about it. In other words, the bigger customers all got a slight discount from the market price in effect, but there never was any so-called "preferential discount" to any single concern.

Mr. Farrell said he had no intimate knowledge of the workings of the billet, structural and rail "pools" that existed down to 1904, and that he attended no "pool" meetings and did not know who the members of these associations were. Judge Dickinson asked him if he knew of a contract entered into by the Pittsburgh Steel Co. and the Carnegie Steel Co. in 1903, whereby the former was to buy all its billet requirements, with the exception of a tonnage previously contracted for with the Clairton Steel Co. from the Carnegie Steel Co. The price specified was $2.00 per gross ton under the "billet pool" price. Mr Farrell did not regard this as a preferential contract and said that as far as he knew there was nothing secret about it. These contracts were always generally talked about in the trade and mentioned by the trade papers, he said.

Prices Constantly Declined

Judge Dickinson then took up another statement from Mr. Farrell's testimony made in direct examination. This was to the effect that the prices of all commodities have shown a constant decline from 1901, down to the present time. The attorney said that the period he was interested in was from the time of the formation of the Steel Corporation to the date of the filing of the present suit by the government. He acordingly questioned the witness regarding the prices of almost every product made by the Steel Corporation. This examination, which took up the greater part of the day, showed that in only one or two commodities was there a "constant" decline in price from 1901 to 1910, inclusive. The witness's answers showed, however, that in some of the intervening years, the prices on most of the commodities were considerably lower than in 1901. Most of the prices were higher in 1910 than in 1901. In most lines the prices varied from year to year, according to the general trend of the market.

One of the results of this portion of the examination was that the witness thereafter applied the word "constant" with great care, so that when he was asked if he was a constant reader of the trade papers between 1901 and 1910, he replied:

"No, I was an occasional reader."

"You stated in your previous testimony in this case that the Steel Corporation has always granted more favorable prices in selling to manufacturers in this country when it was known that they were to sell those goods in their export business,"

Cost of Importing Chilean Ores

During President Schwab's cross-examination by Judge Dickinson, the questioning developed some interesting information concerning the situation of the Bethlehem Steel Co. as to its Chilean ore supply. He said it will cost 6 cents per unit of iron content, or $4.08 per ton of 68 per cent ore, to ship Chilean ores by the Panama canal to the Bethlehem blast furnaces. This includes cost of mining and all transportation and canal tolls.

said Judge Dickinson. "Does that mean that the Corporation charged more in the domestic trade than it did in the foreign trade?"

"It means," said Mr. Farrell, "that anyone who wanted to develop an export trade was welcome to our assistance at all times. We extended aid to all comers.

"The government," continued President Farrell, "has empowered the Interstate Commerce Commission to make lower freight rates on shipments destined abroad than on shipments to domestic points. In the same manner, we help other manufacturers to develop an export trade by selling them at a low price when the goods are to be shipped abroad."

Was Plainly Satisfactory

This answer plainly afforded considerable satisfaction to the Steel Corporation attorneys who have contended all along that the development of this country's iron and steel export trade is entirely due to the activity of the Corporation in this direction.

The last hour on Thursday and all of Friday, Judge Dickinson devoted to attempting to disqualify the statistical data which Mr. Farrell had submitted on direct examination. The first exhibit he attacked, was one showing the total production in gross tons of each different kind of wire product made by the American Steel & Wire Co. This table covered the period 1901 to 1912, inclusive; it showed the Steel & Wire company's percentage of the country's total production in each grade for each year, and also the percentage of that company's products that went into the export trade each year. It indicated that the Steel & Wire company's percentage of the country's total capacity has been steadily diminishing in most lines of wire goods, while its percentage for the export trade has been constantly increasing. Mr. Farrell said that from his knowledge of the business he knew these figures were correct.

"Did you personally prepare them?" asked Judge Dickinson.

"No," said the witness. "They were prepared under the supervision of the comptroller of the Steel Corporation."

"Then your testimony as to their accuracy is based more upon your faith in his work than upon your own personal knowledge of the figures?"

"Partly on my own knowledge, because of my familiarity with the business," said Mr. Farrell.

"Without going back to the records from which these figures were compiled, and depending entirely on your own knowledge of the business, Mr. Farrell, could you state positively as to the accuracy of these figures?"

"I could not any more than anybody else could," said the witness. "I consider them correct, however."

Government Objects

The government attorney then entered an objection to this exhibit on the ground that its contents were hearsay and secondary, having been prepared by other people, from records compiled by still other people.

Following a somewhat similar series of questions, Judge Dickinson for the same reasons objected to other statistical data which had been introduced during Mr. Farrell's direct examination. One of these showed the figures for the export trade of the Steel Corporation, showing how rapidly it increased between the years 1901 and 1912, inclusive; this table also showed that the export trade of other steel manufacturers in this country is small and has not increased to any considerable extent. Another table showed the tin plate exports of the country, showing that the exports of the American Sheet & Tin Plate Co. have been growing constantly; it also showed that it is the only concern exporting tin plate from this country. Another table, prepared from the statistics of the American Iron and Steel Association, showed that the Corporation's percentage of the merchant bar capacity of the country has been decreasing steadily.

The Cotton Tie Pool

Mr. Farrell was then questioned in reference to allotments which were made by the cotton tie pool in 1901. In that year, it appeared, the Carnegie Steel Co. agreed to pay the Illinois Steel Co., $150,000, in order to keep the latter out of the cotton tie business; and on the formation of the Steel Corporation an attempt was made to abrogate this agreement. Regarding this matter, Mr. Farrell said he could not testify, as he had no knowledge of allotments or dealings in the cotton tie pool.

The government attorney also tried to shake Mr. Farrell's statement that the Corporation has sold to the International Harvester Co. only 87,000 tons of material, while to competitors of the Harvester company it has made sales of between 800,000 and 900,000 tons. The witness, however, was sure of this testimony.

All of the objections made by the government will be passed upon later by the United States judges, as the special examiner has not the authority to decide any such question.

Farrell Tells About Contracts

The proceedings Monday of this week were unusually trying to the patience of all connected with them, being devoted chiefly to quibbling over legal technicalities. President Farrell, who was recalled for further cross-examination, was closely questioned by Judge Jacob M. Dickinson, of government counsel, concerning the testimony he submitted in direct examination as to conditions of competition in the bridge and structural fabricating industry. The government attorney sought to show that Mr. Farrell's testimony was based largely upon what he had heard from other individuals, both in and out of the Steel Corporation's organization, and that only a very little of it was based on his own personal knowledge.

His Sources of Information

In direct examination, the counsel for the defense had introduced as an exhibit a list of some 370 bridge and structural fabricators who were in competition with the American Bridge Co., on May 15, 1911, and from this exhibit, Mr. Farrell had been questioned by Cordenio A. Severance, of Corporation counsel, regarding the class of business each of these companies was engaged in. Judge Dickinson Monday took up these various concerns, one after another, and questioned Mr. Farrell as to the sources of the information upon which he had based his testimony.

"Do you know Dietrich Bros. of Baltimore, and do you know of any contracts they took?" queried the government attorney.

"Yes, I know Dietrich Bros. very well personally," said Mr. Farrell. "They took the contract for the Emerson building in 1910 and several other contracts between then and May 15, 1911, but I forget the names of the buildings."

Judge Dickinson then mentioned a number of other companies regarding

which Mr. Farrell had testified, asking him whether his testimony was based entirely on his own personal knowledge of the various concerns as competitors of the American Bridge Co. on May 15, 1911.

"Some of my testimony," said the witness, "was based on my own personal knowledge and some of it was based on facts which I had learned from my subordinates and associates in the business."

Thereupon the government attorney objected to all of Mr. Farrell's testimony concerning bridge and structural fabricating concerns on the ground that it was hearsay.

President Farrell was questioned as to the Mosher Mfg. Co., of Texas, and whether it was a competitor of the American Bridge Co. in that state.

"We are not competitors in Texas at present, in the bridge and structural business," said Mr. Farrell, "as the bridge fabricators in that state have an advantage over us which amounts to practically $4 a ton. This is due to the fact that lower freight rates are granted on intra-state commerce than on inter-state traffic."

The witness stated that from his general knowledge of the structural and bridge fabricating business, he was able to state that the figures included in the statistical exhibit upon which Judge Dickinson had questioned him, were substantially correct.

The Harvester Contract

Judge Dickinson next read from the minutes of the Illinois Steel Co. an extract in which the president of that concern reported that a contract had been made to sell to the International Harvester Co., 40,000 tons of bars at $1.46 per 100 pounds, Chicago, which was less than the market price then current, the president remarking that this special rate had been given because of the position of the Harvester company among the implement manufacturers. According to this minute, it was decided that no announcement should be made of the price at which the contract had been taken but that news of the size of the contract should be given out, as this would cause other manufacturers to come into the market.

"Was not this a secret preferential contract, Mr. Farrell?" asked the government attorney.

"No, I would not call that a secret preferential contract," said the witness. "It was merely a matter of salesmanship. You never can tell when the implement makers will come into the market for their requirements. This contract was simply made to start buying on the part of the other agricultural works."

Judge Dickinson next took up Mr. Farrell's testimony to the effect that the National Tube Co. in 1901 controlled from 56 to 58 per cent of the tube manufacturing capacity of the country. The attorney tried to show that after the merging of the National Tube Works Co. and the Standard Steel Tube Co. into the National Tube Co., the chief competitor of the latter in seamless tubes was the Shelby Steel Tube Co. The latter company was taken over by the National Tube Co. in 1902, a year after the formation of the Steel Corporation. Judge Dickinson asked the witness to name the various tube companies in business and to tell what percentage of the country's capacity was controlled by each in 1901. This Mr. Farrell refused to do, as he said he could not estimate their capacities accurately.

Judge Dickinson took up the tin plate statistics, submitted by counsel for the defense during the direct examination of Mr. Farrell. These showed the percentage of the country's output controlled by both the Steel Corporation and the independents for the years 1901 and 1912, respectively. They also showed the Corporation's tin plate exports for the two years. Judge Dickinson wanted to know how these statistics had been prepared. Mr. Farrell, owing to the attorney's unwillingness to show him the exhibits, was greatly confused as to which table it was that Judge Dickinson was inquiring about. The judge finally showed him the exhibit in question, and the witness then stated that it had been prepared in the Pittsburgh office of the American Sheet & Tin Plate Co. and had then been taken to Philadelphia to be compared with the records of the American Iron and Steel Association.

"Did you, personally, compare them with the records in Philadelphia?" queried the attorney.

"No," replied Mr. Farrell, "but they were compared with Mr. Gray's figures by one of our competent men."

"Do you know in what manner they conducted this comparison?" persisted Judge Dickinson.

"I do not," replied Mr. Farrell, who was slightly nettled, "but Mr. Severance can subpoena the man who made the comparison and he will tell you all about it."

The government attorney, thereupon, objected to the entering of the tin plate statistics in the book of exhibits.

Harriman Business

The next subject taken up was the method by which the Harriman lines formerly awarded contracts to the American Bridge Co. Judge Dickinson wanted to ascertain whether it was the custom for that system ever to make contracts with the Bridge company, irrespective as to bids. The witness stated that as far as he knew, all contracts with the Harriman lines were secured after competition with other concerns. He said it was the custom for the purchasing agent of the Harriman lines to receive competitive bids and award the contract at the best price he could obtain.

The attorney asked Mr. Farrell to explain what was meant by a "convenience contract". This, said the witness, was a form of contract originated by the purchasing agent of the Harriman lines; it called for a maximum and a minimum price in order to provide for market fluctuations which might occur during the period covered by the contract.

These convenience contracts called for a considerable tonnage, as a rule, and this was specified from time to time by the railroad company for small fabricating jobs as they occurred. Heavy bridges and large structures were always let separately, said Mr. Farrell, and were never specified on the convenience contracts. President Farrell told about one convenience contract made by the Harriman lines with the American Bridge Co., in 1904, which called for either 10,000 or 15,000 tons of material, which specified a maximum and min-

Andrew Carnegie's Mingled Feelings

While cross-examining President Schwab last week, Judge Dickinson read to him portions of his testimony before the Stanley committee. The government attorney pointed out that on that occasion Mr. Schwab had stated that Andrew Carnegie was reluctant to sell out his interest in the Carnegie Steel Co., while on Tuesday he had testified in direct examination that Mr. Carnegie was eager to sell.

"Please explain these two statements," directed Judge Dickinson.

"Well, Mr. Carnegie was eager to sell because he wanted to devote his money and the rest of his life to philanthropic purposes", said Mr. Schwab. "He was reluctant because he knew it meant relinquishing his power and prestige in the steel business."

imum price, of which the market price then current was approximately a mean.

The witness was questioned in reference to his statement that the number of competitors of the American Sheet Steel Co. increased rapidly between 1901 and the present. In direct examination, Mr. Farrell had mentioned a number of the sheet steel company's competitors in both years. Judge Dickinson wanted to know if in mentioning these numbers, Mr. Farrell had depended upon his own knowledge or from what had been reported to him. The witness explained that he knew these figures to be about right from his knowledge of the business. He named a number of the sheet steel company's competitors of 1901.

Schwab Completes His Testimony

President Charles M. Schwab, of the Bethlehem Steel Corporation, was excused from the witness stand late Wednesday afternoon, May 21, after another day spent in undergoing cross, re-direct and re-cross examination on all sorts of details regarding the Steel Corporation dissolution case.

President Schwab was questioned largely upon the testimony which he gave before the industrial commission in May, 1901, upon his speech before a bankers' convention in Chicago in December, 1901, upon his remarks made during the congressional tariff hearings in 1908, and upon his testimony before the Stanley committee.

Judge Dickinson wanted Mr. Schwab to explain his assertion made before the tariff committee in 1908, that $28 was regarded as a fair price for standard steel rails, and that a reduction of the price made by any manufacturer would lead to a steel rail "war." Mr. Schwab testified that this price has been established since May, 1902, and naturally any reduction from this price by one concern in an attempt to get business would be met by greater reductions by other concerns.

Judge Dickinson tried hard to shake Mr. Schwab's statement that the Steel Corporation's iron ore reserves in 1901 were worth $1 at on in the ground. The witness could not think of any actual sales made at this price, prior to 1901, but maintained that he was sure of his statement. One dollar a ton in ground was not too high a valuation, he said, taking into consideration that the ores were of high quality and of different grades, that the lands containing them were conveniently situated for mixing and that the entire group of Corporation mines could not be duplicated.

Judge Dickinson read from the Carnegie Steel Co.'s book of minutes the reports of transactions in 1899, and other years in which the Carnegie company obtained ore at low figures. In one such transaction, upon the payment of $500,000 for one-half of the fee of the Rouchleau mine, the company obtained 50,000,000 tons at 2½ cents a ton in the ground. Mr. Schwab did not remember the details of any of these deals. He said that most of these purchases were by lease and not in fee, and explained the complications which existed in the Lake Superior district through numerous transfers. There were ores purchased at that time at a price which, if figured upon the known amount of ore in the mines when purchased, would have shown a value of $1 a ton, he said. Judge Dickinson wanted to know if, in case the Corporation had decided to sell its ore properties separately, it could have obtained $1 a ton. Mr. Schwab thought it could have done so for most of the ore.

The attorney then tried to show by Mr. Schwab's assertions at other times that no steel concern of the same size as the Steel Corporation, which might have been formed any time between 1901 and the time of the filing of this suit in 1911, could have obtained its supplies from the Lake Superior district. This Mr. Schwab admitted. He said that in 1901 from 75 to 80 per cent of the ore consumed in this country came from there, while in late years this percentage has decreased by about 5 per cent on account of ore importation. He said that the Steel Corporation secured three-fourths of the Lake Superior ore in 1901; but he added that a new steel concern as large as the Corporation could exist if it were built in the east and used foreign ore. He said in answer to one of Judge Dickinson's questions that it would be possible for other concerns in this country to make all the products that the Corporation does, but not on as extensive a scale. Said he: "If I live and have money enough, Bethlehem will do that ultimately."

In 1902, Mr. Schwab told the industrial commission that the Corporation had 70 per cent of the country's producing capacity; today, he said, that was not sufficient to enable a company to fix prices. He said that the ownership of 30 per cent of the capital stock in any company meant control of that company, as the owner of that 30 per cent could gather about him enough shareholders having his views to give him control.

Judge Dickinson pointed out that before the Stanley committee, Mr. Schwab had said that Andrew Carnegie was reluctant to sell out his interest in Carnegie Steel Co., while now he says that Mr. Carnegie was eager to sell. Mr. Schwab explained that Mr. Carnegie was eager because he wanted to devote his money to philanthrophy, and reluctant because it meant relinquishing his power and prestige. Judge Dickinson called attention to the fact that the Steel Corporation was a union of Moore, Rockefeller, Morgan and Carnegie interests and that Mr. Widener, of the American Tube, and Mr. Rogers of the Standard Oil Co., were Corporation directors. He wanted to know if there was any other group in the country as strong financially and if this did not include all the interests very strong financially. Mr. Schwab said he didn't know, as he was a practical man and not a financier.

The judge wanted to know what would happen to the eastern manufacturers if Cuba, Chile and other countries were to put an export duty upon iron ore in conjunction with a high import tariff rate in this country. Mr. Schwab smiled and said it depended on the size of these duties. Judge Dickinson tried to get from the witness information regarding percentages of ore furnished by Pennsylvania, New York and other states, but Mr. Schwab said he did not know. The attorney objected to Mr. Schwab's testimony on Cuban ores because the witness said he got his information from his engineers. He said it will cost 6 cents per unit of iron content or $4.08 per ton of 68 per cent ore to ship Chilean ores by the Panama canal to the Bethlehem Steel Co.'s works. This includes cost of mining, all transportation and canal tolls. Mr. Schwab on Wednesday said that he offered $1 per ton for ore in the ground in the last two weeks but this offer was refused. Thursday he said the ore was that of Witherbee, Sherman & Co., at Port Henry, N. Y.

DUTY ON FERRO

Proposed by Underwood Will be Fought in the Senate.

Indications point to a spirited effort being made in the United States senate to revise the terms of the paragraph in the Underwood bill, providing for the increase in the duty upon ferro-manganese, which is highly objectionable to the great mass of the consumers of this alloy, particularly to the independent steel manufacturers.

The Underwood bill has taken ferro-manganese from its position with pig iron in the Payne-Aldrich tariff, subject to a specific duty of $2.50 and has reclassified it with the high-grade and more costly ferro-alloys and metals which are made dutiable at 15 per cent ad valorem. At the present price of $61, eastern seaboard, for ferro-manganese, the 15 per cent ad valorem duty which is computed upon the works price of the material at the plant of the foreign maker or, at this time, on about $56, represents a duty of approximately $8.40 per ton. The Underwood bill in its present form, therefore, means an increase of about $6 per ton to the consumers of this alloy at the current market.

The consumers of ferro-manganese in this country who import this material from English and German makers, include in addition to numerous foundries, all steel makers exclusive of the United States Steel Corporation. The Steel Corporation is the only consumer in the United States manufacturing ferro-manganese for its own consumption. This manufacturing is done by the Carnegie Steel Co. at Pittsburgh, and by the Illinois Steel Co., at Chicago. It has been pointed out that the needs of ferro-manganese of this steel producer are so heavy annually that it has been forced to produce this alloy to protect itself against exorbitant prices and possible shortages, inasmuch as it requires a large portion of the world's limited output. The Steel Corporation imports largely each year manganese ore principally from Russia, India and Brazil. Manganese ore continues on the free list under the Underwood bill. The deposits of manganese ore in this country are small and widely scattered, so that the output yearly is practically nominal. Most of the manganese ore in this country is mined in Virginia.

The immediate importance of the increase in duty to the importing consumers of ferro-manganese is the fact that many of them have contracted for their requirements to the end of the present year. These buyers will be obliged to absorb the increased duty, because, under their purchasing contracts, all changes in duty are made to the account of the buyer. The greatest objection the consumers who import the supplies are making to the change in the duty is the uncertainty which will constantly exist as to just what duty they will be called upon to pay under the varying ad valorem rate. It has been strongly intimated by some of the leading independent steel companies that if the bill as now proposed is enacted, they will turn some of their smaller blast furnaces to the manufacturing of their own supplies. A blast furnace making ferro-manganese, it is calculated, will produce about one-third of its rated output of pig iron.

Accompanying tables show the domestic production and imports of ferro-manganese and manganese ore and the average market prices by months of ferro-manganese at Baltimore for the years indicated.

DOMESTIC OUTPUT AND IMPORTS OF FERRO-MANGANESE AND MANGANESE ORE

	Ferro-Manganese.		Manganese Ore.	
	Domestic output.	Imports.	Domestic output.	Imports.
1903.....	34,891	41,519	2,825	146,056
1904.....	57,076	21,814	3,146	108,519
1905.....	62,186	52,841	4,118	257,033
1906.....	55,520	84,359	6,921	221,260
1907.....	55,918	87,400	5,604	209,021
1908.....	40,642	44,624	6,144	178,203
1909.....	82,209	88,934	1,544	212,765
1910.....	71,376	114,278	2,258	242,348
1911.....	74,482	80,263	2,457	176,852
1912.....	125,379	99,137	.....	300,661

PRICES OF FERRO-MANGANESE, BALTIMORE.

	1909.	1910.	1911.	1912.	1913.
January	$44.00	$44.37	$38.12	$42.95	$65.00
February	44.00	44.00	39.57	41.39	65.00
March	42.50	43.10	39.30	41.00	65.00
April	41.50	41.50	38.57	43.62	61.00
May	41.00	40.37	38.45	47.50	.....
June	41.00	39.70	38.45	48.50	.....
July	41.50	39.25	38.57	48.87	.....
August	41.50	39.50	38.75	52.20	.....
Sept.	42.50	39.40	38.45	55.75	.....
October	43.00	38.80	38.64	58.30	.....
Nov.	44.50	38.75	39.45	60.62	.....
Dec.	45.00	38.35	41.70	65.00	.....

INTERESTING FACTS

Developed in Regard to Cleaning Blast Furnace Gas.

In the discussion, at the Baltimore meeting of the American Society of Mechanical Engineers, of Charles C. Sampson's paper on "Gas Engines Using Blast Furnace Gas", referred to elsewhere in this issue, some interesting facts were brought out in regard to the cleaning process. Fred H. Wagner Jr., chief engineer of the Bartlett-Hayward Co., Baltimore, called attention to the fact that, besides the Theisen washers mentioned by Mr. Sampson, there are two others which have rendered noteworthy service in Europe, viz.: the Schwarz washer and the Feld washer. Each of these, and particularly the Feld, requires considerably less power than the Theisen.

At the blast furnaces in Donawitz, where 1,600,000 cubic feet of blast furnace gas is treated hourly, the total power consumption of the Schwarz washers was 124 to 128 horsepower. At the blast furnaces in Pompey, France, of exactly the same capacity, the Feld washers used from 50 to 55 horsepower, including the power necessary for exhausters. Mr. Wagner did not have figures showing separately the power taken by the washers and exhausters but estimated the washer power at 15 to 20 horsepower and the exhausters at 35 horsepower. This great difference in power requirements, he stated, arises from the fact that in the Feld washer there is absolutely no back pressure, the apparatus operating with an even gage on both the inlet and outlet; while the Schwarz washer throws considerable back pressure.

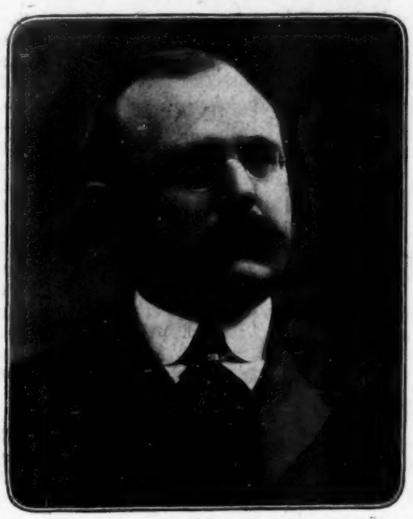
Prior to the use of the Feld washers at Pompey it was necessary to open up the valve chests in the engines about once every 10 days to remove the accumulated dust. Since their installation a cleaning of these chests every three months is sufficient. The washers have now been in operation two and a half years without any shut down. They are self-cleaning, the water carrying the dust leaving the washer in the shape of a mud which is easily handled by means of centrifugal pumps.

A Feld washer, which is of the vertical centrifugal type, was recently placed in operation in this country at the works of the American Smelting & Refining Co., Maurer, N. J. Its function there is to remove the last traces of gold, silver, lead and silenium from the gas which comes from the refining furnaces.

Mr. Wagner concluded with a statement of the cost of cleaning 100,000 cubic feet of blast furnace gas to the point where it does not contain more than 0.01 grain of dust per cubic foot and to reduce the temperature from 500 to 86 degrees Fahr. According to his figures the cost of this with nine coolers and the necessary Theisen washers, less labor and exhauster power, would be 14½c; with nine coolers and Schwarz washers, 11c, and with three Feld primary and two Feld secondary or final washers, 5.2c. These figures are based on a cost for water of $10 per 1,000,000 gallons and power at 1c per kilowatt-hour, in a plant capable of handling 5,400,000 cubic feet of gas per hour.

OBITUARIES

Dr. Elmer E. Brown, president of the National Sashweight Manufacturers' Association, head of the firm of E. E. Brown & Co., Philadelphia,



DR. E. E. BROWN

manufacturer of sash weight castings, and who was prominently identified with foundry and business interests in Philadelphia, died in that city, May 23, at the age of 53. Dr. Brown entered the employ of Hoopes & Townsend, Philadelphia, iron merchants, in 1881 and later engaged in the sash weight manufacturing business. After he had been successful in business, he entered the Jefferson Medical College at the age of 36 years. Following his graduation, he continued in the manufacturing field. He was vice president of the Philadelphia Foundrymen's Association, president of the Buchanan Foundry Co., Lebanon, Pa., director of the Waterbury Foundry Co., Waterbury, Conn., and a director in other business organizations. He was also vice president of the Temple University, Philadelphia. Two sons, Clarence, a member of the firm of E. E. Brown & Co., and Harold, in charge of the Buchanan plant at Lebanon, survive.

John T. Brown, 68 years old, vice president and general manager of the Damascus Bronze Co., Pittsburgh, died last week. He was one of the first to manufacture phosphor bronze in this country. Mr. Brown was identified with the brass trade more than 50 years. Before coming to Pittsburgh, he was connected with the Brown Smelting Co., Chester, Pa., and at one time with the Paul S. Reeves Co., Philadelphia.

George Hampton Smith, 34 years old, one of the Carnegie Steel Co.'s foremost blast furnace experts, died last week in Aspinwall, Pa., following an attack of pneumonia. After being graduated from high school, Mr. Smith joined the Carnegie company as a blast furnace draftsman and under the tutelage of John Collins and Capt. James Scott, veteran blast furnace superintendents of the company, Mr. Smith developed into a valuable engineer. He joined the night school at the Carnegie Institute of Technology, and was graduated in 1910. Mr. Smith was one of the most successful blast furnace constructors in the Pittsburgh district and has been granted several patents on improvements. Within recent years, he had met great success with thin lined furnaces and had spent considerable time at Mingo Junction, improving and remodeling stacks at that point. Recently he had started to remodel the stacks of the company at the Edgar Thomson works. He was a

GEORGE H. SMITH

member of the American Society of Mechanical Engineers and was active in the Aspinwall borough council. A widow and two sons survive.

FLOOD SCRAP

Will be Sold by Commissioners of Hamilton County.

The board of county commissioners of Hamilton county, O., will sell at public auction in Cincinnati, on June 13, the old steel and other materials of bridges destroyed by the recent floods. There will be materials from seven bridges sold and each will be sold separately. The conditions of the sale will require that the old iron, etc., be removed from the streams which they previously spanned not later than 150 days from the date of sale. Following are the bridges that will be sold, the old iron and steel of which will total 1,820 tons: Bridge over Big Miami river at Elizabethtown, length 587 feet, approximate number of tons, 900; bridge over Big Miami river at Cleves, length 400 feet, approximate number of tons 140; bridge over Big Miami river at New Baltimore, length 465 feet, approximate number of tons 360; bridge over Little Miami river at Loveland, length 532 feet, approximate number of tons 170; bridge over Little Miami river at Remington, length 290 feet, approximate number of tons, 100; bridge over Little Miami river at Union Levee, length 350 feet, approximate number of tons 70, and wire; bridge over Whitewater river at Harrison, length 450 feet, approximate number of tons, 80, and wire.

The earnings of the American Steel Foundries Co., Sharon, Pa., for the quarter ending March 31, last, amounted to $670,558. Operating profits for the first quarter of 1912 amounted to $188,650. This shows a gain for the first three months of 1913.

Chairman of Labor Committee

Washington, May 27.—The house ways and means majority has chosen Representative Lewis, of Maryland, as chairman of the committee on labor, to succeed to the place held by Secretary of Labor Wilson during the last congress. The chairmanship was discussed at a luncheon conference at the capitol, Saturday, by Secretary Wilson, Representative Lewis, Secretary Frank Morrison and other members of the American Federation of Labor.

MEN OF THE IRON TRADE

F. J. ANDERSON has been appointed city engineer of Niagara Falls, Ont.

JOHN A. McGREGOR, president of the Union Iron Works, San Francisco, is spending a month in the east.

H. T. LATTO has been appointed eastern sales manager for the National-Acme Mfg. Co., Cleveland, succeeding L. M. Waite, resigned.

W. L. SAUNDERS, formerly president of the Ingersoll-Rand Co., 11 Broadway, New York City, has been elected chairman of the board of directors.

H. J. BOSSLER, until recently connected with the Keystone Boiler & Foundry Co., Columbia, Pa., has resigned to take a position in Reading, Pa.

JAMES C. POTTER, of the Potter & Johnston Machine Co., Pawtucket, R. I., has gone to Scotland to join his wife and children for a tour of Europe.

W. A. MYLER, of Pittsburgh, at the recent meeting of the directors, was elected vice president of the Standard Chain Co., to succeed Robert Garland, resigned.

TODD KENNEDY, engineer of the Pettit mine of the Rpublic Iron & Steel Co., Gilbert, Minn., has been transferred to the company's mines at Negaunee, Mich.

GEORGE B. STORER, vice president of the Standard Steel Tube Co., Toledo, O., has been appointed a member of the general educational committee of the National Drainage Congress.

H. E. TIDMARSH, former president and general manager of the Friction Pulley & Machine Works, Hudson Falls, N. Y., has taken charge of the Green Bay Barker Co., Green Bay, Wis.

CHARLES H. FLYNN has resigned as expert and advisory engineer for the William A. Harris Steam Engine Co. He has taken a position as consulting engineer for the A. W. Harris Oil Co.

WALTER KNAPP, former assistant shop superintendent, machinery division, Philadelphia navy yards, has accepted the position of chief engineer in the Cleveland office of the Standard Engineering & Drafting Co.

AXEL LEVEDAHL, chief engineer of the Independent Pneumatic Tool Co., Aurora, Ill., sailed from New York on the Lusitania, May 21, for a European trip. While abroad, Mr. Levedahl will visit the prominent ship yards and manufacturing plants.

DWIGHT E. WOODBRIDGE, mining engineer of Duluth, has just come from the hospital, where he spent five weeks on account of injuries to an eye sustained while making an examination of ore properties in South Dakota.

W. H. BANCK, former junior engineer of the United States engineering department and recently in charge of the engineering work at Cape Lookout harbor, has opened an engineering office in the Garrell building, Wilmington, N. C.

W. H. CHRISTY, of the Bessemer Foundry Co., has been elected vice president of the reorganized Imperial Co., Grove City, Pa., manufacturer of brass goods. The other officers elected are Mrs. Ruth B. Spearman, president; A. R. Anderson, secretary and treasurer; J. M. Reynolds, sales manager; John A. Nordstrom, superintendent.

BELA NAGY has joined the engineering staff of the Samuel Austin & Son Co., Cleveland, industrial engineer and designer and constructor. Mr. Nagy, who has specialized in industrial engineering, received his education in Budapest. He has been identified with the Davenport Foundry & Machine Co., the Corn Products Co., the Deere Plow Co. and the Rumely Co.

DEAN HERMAN SCHNEIDER, of the engineering department of the University of Cincinnati, is selected as the third arbitrator in the controversy between the Cincinnati Traction Co. and its employes. He was chosen by Walter Draper, the company's representative, and John Frey, acting for the employes. Mr. Draper, before becoming secretary of the company a number of years ago, was a newspaper man and a correspondent of The Iron Trade Review in Cincinnati. Mr. Frey is editor of the Iron Molder's Journal.

CLAY SPRECHER has been appointed Pittsburgh sales manager for the C. & G. Cooper Co., engine builder, Mt. Vernon, O., with office at 1323 Oliver building. Mr.

CLAY SPRECHER

Sprecher's engineering training and wire experience in the power machinery business qualify him to handle this work in a successful manner. In addition, he is looking after the Chapman Engineering Co.'s sales of rotary gas producers, which are built in the Cooper company's works. Mr. Sprecher was for a number of years associated with the Allis-Chalmers Co., as sales engineer.

FRED M. PRESCOTT, of Milwaukee, who is probably the best known builder of mine pumps in the country, particularly on the iron ranges, has resigned as president of the Fred M. Prescott Steam Pump Co. About two years ago, the latter was purchased by the International Steam Pump Co., with the understanding that Mr. Prescott should remain in charge until other satisfactory arrangements could be made. He has now, however, severed his connection with that company and will devote his attention to other lines of business in which he is interested.

Iron and steel manufacturers and machine tool makers are taking an increased interest in the proceedings of the American Society of Mechanical Engineers, as evidenced by the number in attendance at the Baltimore convention last week. Among the members present were: Samuel T. Wellman, chairman, Wellman, Seaver, Morgan Co., Cleveland; F. Rodney Pleasonton, engr., Pennsylvania Steel Co., Harrisburg, Pa.; Walter J. Muncaster, vice president and general manager, Cumberland Steel Co., Cumberland, Md.; Emmett B. Carter, chief engineer, Midvale Steel Works, Philadelphia; Wm. Phillips Caine, steam expert, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.; Dwight Kellogg Bartlett, general manager and assistant treasurer, Builders Iron Foundry, Providence, R. I.; H. Morell Bailey, safety inspector, Carnegie Steel Co., Allegheny, Pa.; William F. Austin, superintendent, Eddystone plant, Belmont Iron Works, Eddystone, Pa.; Lawrence Addicks, superintendent, U. S. Metals Refining Co., Chrome, N. J.; Wm. Henry Pierce, vice president and general manager, Baltimore Copper Smelting & Rolling Co., Baltimore; Wilber O. Platt, vice president and superintendent, Jos. Reid Gas Engine Co., Oil City, Pa.; Wilfred Lewis, president, Tabor Mfg. Co., Philadelphia; Cav. Gaetano Lanza, engineer, Baldwin Locomotive Works, Philadelphia; Oberlin Smith, president, Ferracute Machine Co., Bridgeton, N. J.; Elmer Hartson Neff, New York, manager, Brown & Sharpe Mfg. Co., New York City; Horace Kimball Jones, mechanical superintendent, Corbin Screw Corp., New Britain, Conn.; Wanton Martin Gladding, mechanical superintendent, Morse Twist Drill & Machine Co., New Bedford, Mass.; J. Wendell Cole, district manager, Wm. Sellers & Co., Columbus, O.; Walter L. Cheney, sales manager, Lucas Machine Tool Co., Cleveland; Luther D. Burlingame, chief draftsman, Brown & Sharpe Mfg. Co., Providence, R. I.; Geo. Nixon Van Derhoef, engineer, Dodge Mfg. Co., New York City; Richard H. Rice, manager, General Electric Co., West Lynn, Mass; Norman Lewis Sammis, representative, Builders Iron Foundry, Philadelphia; Nehrbas Frederick Philip, factory manager, American Locomotive Co., Baltimore; Thomas H. Mirkil Jr., vice president and general manager, Poole Engineering & Machine Co., Baltimore; Thomas Alfred Marsh, mechanical engineer, Green Engineering Co., Chicago; O. Zell Howard, of Griscom-Spencer Co., New York City; Ernest Woodruff Greene, sales engineer, Alberger Pump & Condenser Co., New York City; Walter C. Giele, Harrison Safety Boiler Works, Philadelphia; Thos. C. Flinn, general superintendent, Kennedy Valve Mfg. Co., Elmira, N. Y.; Chas. Fitzgerald, manager sales and assistant general manager, Pittsburgh Valve Foundry & Construction Co., Pittsburgh; Wm. Grosvenor Ely, superintendent construction, General Electric Co., Schenectady, N. Y.; Geo. B. Conrath, general manager, Nagle Corliss Engineering Works, Erie, Pa.; Frederick N. Connet, sales manager, Venturi Meter Dept., Builders Iron Foundry, Providence, R. I.; Cloyd M. Chapman, engineer in charge, Westinghouse, Church, Kerr & Co., New York City; Geo. M. Bartlett, mechanical engineer, Diamond Chain Mfg. Co., Indianapolis; Edward R. Archer, chief engineer, Tredegar Co., Richmond, Va.; Edwin Hugh Ahara, general superintendent, Dodge Mfg. Co., Mishawaka, Ind.

NEW BUSINESS

In the machinery and machine tool market the aggregate of orders and inquiries has been fairly well maintained, representing small lots and single machines, well scattered. Buyers continue to show a disinclination to stock up in excess of present needs, probably on account of the tariff situation. Dealers are inclined to discredit the apparently general belief that tariff reductions would produce a marked effect upon the trade. Dealers in contractors' supplies are doing a fair amount of business, although the aggregate is not as satisfactory as it was earlier in the year. Some improvement is noted in industrial building activity, several contracts having been let recently for that class of construction work, and announcements are out for a number of additions to existing plants.

In New York, machinery business continued of a moderate volume during the past week. Among the machine tool dealers there is a feeling that some important projects are being held up pending tariff action. Nothing has developed concerning the large lists of shop equipment that have been before the trade for several weeks. The government has distributed a list of machine tools, wanted for the Pearl Harbor Navy Yard, Hawaii. Separate bids with and without motor equipment are requested.

In Chicago, business in machine tools seems to have slackened materially. During the previous week quite a large number of inquiries from large buyers were reported, but it has developed that in most of these cases action will be postponed for the present pending the adjustment of the financial situation and further knowledge of crop conditions. The Santa Fe list is being closed, some second-hand tools being purchased. Dealers handling second-hand tools are enjoying the greatest volume of business at present, a large amount of which comes from automobile dealers and garage owners.

In Cleveland, dealers report little or no change in the machinery market; if anything, it is duller. An order for induction motors, aggregating approximately 2,000 horsepower, and representing nearly $20,000, is being placed by the Diamond Portland Cement Co., Middlebranch, O., while several smaller requirements for electrical machinery are reported. Generally, the inquiries are for small lots.

In Cincinnati, the machine tool business is mostly on single machines very few large lists having been booked. Both foreign and domestic business have fallen off since the first of the year, the two being about equal at the present time. Orders are very scattered, and come from all sections of the country. It is apparent that a number of large users of machine tools and machinery in general are delaying buying until the market becomes more settled, and are only taking small lots as they need them. The demand for second-hand machinery is not equal to the supply on hand, and this branch of the trade is not very flourishing. Electrical equipment, especially the smaller kind, is selling fairly well. The best sellers in the machinery line at present are mixing machinery and other special grades.

ALABAMA

BIRMINGHAM.—The Ramsay & McCormack interests are planning to build a by-product coke plant in this district, according to statements recently made by Mr. Ramsay. The plant, as planned, will have a daily capacity of 750 tons of coke, and its construction and operation will be similar to the plants now being operated by the Semet-Solvay Co.

ARIZONA

PHOENIX.—The Palmer Forced Draft Burner Co. has been incorporated to manufacture forced draft furnace grates; $100,000; by Thomas J. Prescott and M. A. Rabbitt.

PHOENIX.—The Phoenix Foundry Co., molder of iron and brass, recently started business at Thirteenth avenue and Harrison street. S. H. Rogers, owner of the new plant, was for five years connected with the management of the Williscroft foundry, on South Seventh avenue.

ARKANSAS

ARGENTA.—Plans for the installation of additional equipment in the municipal electric light plant are being considered. S. J. Chapman, manager.

CALIFORNIA

ALHAMBRA.—The American Steel Pipe & Tank Co., Alhambra, is making the Coe smokeless smudge pot. The company has orders for 300,000 pots, requiring 100 cars of steel.

LOS ANGELES.—The American Iron & Brass Foundry has been incorporated; $20,000; by H. L. Kirsh, H. H. Hague and A. Hague, all of Los Angeles.

SAN FRANCISCO.—The Golden West Iron Works, San Francisco, is low bidder, at $177,000, in the third series of bids for the steel work of the municipal auditorium at Oakland.

SAN FRANCISCO.—Steel manufacturers of California, through the Home Industry League, have requested the San Francisco board of public works to allow them to assist in drawing up the plans and specifications for the structural steel for the new city hall, before receiving bids. The board has approved the specifications prepared by Makewell & Brown, architects, in collaboration with consulting architects, and has ordered that bids be called for. Consulting Architect Frederick H. Meyer objected to allowing the local steel manufacturers to help frame the specifications, claiming that it was an attempt to shut out eastern manufacturers. He claimed that the architects were able to draw up fair specifications and that local manufacturers were in a position to underbid eastern competitors.

SAN PEDRO.—The San Pedro Foundry & Machine Co. has increased its foundry force to take care of a rush of orders for large castings.

CONNECTICUT

BRIDGEPORT.—The Pequonnock Foundry is adding an addition to its plant, 40 x 92 feet, one story.

BRIDGEPORT.—The Siemon Hard Rubber Co. has awarded the contract for the foundations of its new factory building, which will be 50 x 175 feet, one story.

BRISTOL.—The Wallace Barnes Co. advises that an addition to its plant, 50 x 90 feet, four stories, is now in the process of construction. This addition will be used for spring and screw machine product manufacturing.

NEW BRITAIN.—W. A. Kinne has awarded a contract to the Torrington Building Co., Torrington, for the erection of a

new foundry, 40 x 67 feet, two stories, with a wing, 40 x 40 feet.

PUTNAM.—At a recent meeting of the stockholders of the Putnam Foundry & Machine Co. it was voted to increase the capital stock of the company from $75,000 to $125,000. The following board of directors was elected: Edward Mullan, F. G. Letters, G. H. Gilpatric, L. E. Smith, Samuel Reynolds, all of Putnam; G. M. Sampson, Woodstock; R. F. Gardner Jr., Providence, R. I.

STAMFORD.—The Excelsior Hardware Co. is planning to erect an addition to its plant, 50 x 78 feet, one story.

STAMFORD.—The Yale & Towne Mfg. Co. has awarded the contracts for two large additions to its local plant, which will provide a brass foundry, pattern vault, pattern shop, core shop and manufacturing building, at a cost of between $150,000 and $200,000. One building will be 50 x 200 feet, six stories, and the other, 245 x 296 feet, three stories. Both buildings will be of steel and brick, fireproof construction.

DISTRICT OF COLUMBIA

WASHINGTON.—Proposals for the construction, complete, including mechanical appliances, for the following United States post offices, will be received by O. Wenderoth, supervising architect, treasury department; Camden, Me., Grass Valley, Cal., Hillsboro, Tex., Jersey City, N. J., and Bedford City, Va.

WASHINGTON.—Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, until June 21, for electric traveling cranes, for the general foundry, navy yard, Puget Sound, Washington. Money available, $19,000. Plans and specifications can be obtained upon application to the bureau or to the commandant of the navy yard named.

WASHINGTON.—Proposals for furnishing three electric, portable hoists, with alternating current, 220 volt, variable speed induction motors, 39,000 feet of hoisting rope of plow steel, 198,000 pounds wire nails, 6,000 pounds roofing nails, hasps, caps, shovels, etc., will be received at the office of the general purchasing agent, Isthmian canal commission, until June 10. Blanks and general information relating to these requirements (Circular No. 777) may be obtained from F. C. Boggs, major, Corps of Engineers, U. S. A., general purchasing agent.

FLORIDA

BRONSON.—The Charlotte Harbor & East Coast Electric Railway Co. will build a line from Venice, Fla., by way of Salt Spring to Charlotte Harbor, a distance of 26 miles. The officers of the company are W. J. Bowling, St. Louis, Mo., president; W. J. Epherson, vice president; T. C. McEherchen, treasurer.

GEORGIA

ATLANTA.—The Miami & South Florida Electric Railway Co., capitalized at $500,000, will build a line from Palm Beach southward, by way of the Miami, to Homestead, Fla., a distance of 100 miles. The officers of the company are R. H. Roome, president; N. A. Cole, vice president; J. M. Cobb, secretary and treasurer.

DALTON.—The Victor Scale Co., recently organized by Messrs. Allen and Joyce, of the North Rome Scale Works, for the manufacture of railroad, wagon and portable scales, will locate the plant in Dalton.

VALDOSTA.—The Valdosta Iron Works is to be re-organized. The name will be changed to the Valdosta Locomotive & Iron Co., and capital added.

ILLINOIS

BLOOMINGTON.—The American Foundry & Furnace Co. recently installed a new cupola.

CARPENTERSVIILE.—Charles E. Giertz & Son, Elgin, Ill., have been given the contract to build a power house and stack for the Illinois Iron Bolt Works Co., Carpentersville, to cost about $30,000. The power house is to be 90 x 100 feet and the smoke stack will be 200 feet high.

CHICAGO.—The National Regulator Co., 208 South Jefferson street, has increased its capital from $50,000 to $100,000.

CHICAGO.—The Crex Patent Column Co. has been incorporated to manufacture steel pipe, structural steel, etc.; $2,500; address in care of Albert Schaffner, 155 N. Clark street.

CHICAGO.—A wagon factory to cost $12,000 will be issued for B. Heinig, 1449 Webster avenue. G. F. Lovedal, 853 Belmont avenue, is architect.

CHICAGO.—The Iron Produce Waterproofing Co. has been incorporated to manufacture waterproofing; $2,000; address in care of Oscar M. Wolf, 105 W. Monroe street.

CHICAGO.—A permit has been granted to the Commonwealth Edison Co. for the erection of a sub-station, 69 x 77 feet, at 4648 Lincoln avenue. Holabird & Roche, 1400 Monroe building, are architects.

CHICAGO.—The Connelly Iron Sponge & Governor Co., 1000-1026 West Twenty-second street, advises that it has recently made considerable investment in handling machinery, including pulverizers, conveyors, elevators, rotary screens, etc.

CHICAGO.—The Commonwealth Adding Machine Co. has been incorporated to manufacture calculating machines and office appliances; $125,000; address in care of G. E. Sandstedt, 3162 N. Clark street.

CHICAGO.—A permit has been granted for the erection of a one-story factory building for the Pullman Couch Co., W. Thirty-eighth and S. Ashland avenue. The new building will be located at 3753-59 S. Ashland avenue. W. P. Doerr, 28 E. Jackson boulevard, architect.

CHICAGO.—The Edmunds Mfg. Co., 2014 Washburn avenue, has been granted a permit to erect an addition to its plant. The building will be brick, three stories, 60 x 80 feet, costing $7,000. The company manufactures cabinet and mill work and some woodworking machinery may be required. D. H. Burnham & Co., 80 East Jackson boulevard, are architects.

CHICAGO.—The Phoenix Hermetic Co., manufacturer of glass jars, 2444 West Sixteenth street, is erecting a new factory building at the corner of Sixteenth and Fourteenth streets. It will be of brick, mill construction, five stories, and will cost $40,000. C. C. Giles is president of the company. R. C. Fletcher, 179 West Washington street, is architect.

DEKALB.—The DeKalb Wagon Co., formerly the Sycamore Wagon Works, advises it is adding to its factory and has just finished a warehouse. The new buildings are to be used in the motor truck business. The company will need no additional machinery.

EAST MOLINE.—The Swen Wire Stretcher Co., of Hampton, Ia., contemplates the erection of a factory building here, 40 x 120 feet.

EAST ST. LOUIS.—The Chicago & Alton Railroad Co. has secured permits for two buildings, on 45 x 594 feet and the other 30 x 549 feet. Estimated cost $60,000.

FREEPORT.—The Stover Mfg. Co. has awarded a contract to the Black Hawk Construction Co. for the construction of its new $40,000 plant.

GLENN.—The Chicago & Alton Railroad Co. is erecting a roundhouse at Glenn at an approximate cost of $80,000. The contract for 113 tons of structural steel required has been let to the Dearborn Foundry Co., 1525 S. Dearborn street, Chicago.

HERRIN.—The Laclede Coal & Coke Co. has been incorporated to mine coal and manufacture coke; $50,000; by W. A. Herrine, Bert. Herrine and Chester C. Childress.

PEORIA.—The International Harvester Co. is planning to erect a warehouse, 168 x 260 feet, six stories, at Thirteenth and South Washington streets, on the site now being occupied by A. A. Bushell & Co., roofing plant.

ROCKFORD.—The Peerless Drill Co., recently incorporated, advises it is manufacturing a line of sensitive drills, tapping and filing machinery. No factory is to be built for the present.

WAUKEGAN.—The Waukegan Fence & Gate Co. has been incorporated to manufacture metal specialties; $5,000; by Henry Mellins, M. E. Mellins and C. F. Arthur.

INDIANA

CRAWFORDSVILLE.—Bids will be opened June 9 for the construction of three bridges in Union township, Montgomery county. Charles V. Hodgkin, chairman board of trustees.

ELKHART.—The Elkhart Hydraulic Co. plans to start operating the new Elkhart power plant at St. Joseph dam, June 1. The plant will generate 2,500 horsepower. Provisions have been made to erect a steam plant adjoining the electrical plant. The machinery tests are being conducted by the James Leffel Co., Springfield, O.

EVANSVILLE.—The Evansville Railway Co. has purchased the Evansville & Mt. Vernon Railway Co. and the Evansville Terminal Railway Co.

GOSHEN.—Bids will be opened June 3 for the construction of four bridges in Elkhart county.

INDIANAPOLIS.—The Prest-O-Lite Co. has bought two and one-half acres across the river from McKees Rocks, Pa., on which a charging plant will be erected at once.

UTICA.—The new plant of the Valley Chemical & Mfg. Co., east of Utica, under construction, will be built of steel and concrete, 80 x 160 feet. The contract for the structural steel has been taken by the Decatur Bridge Co. Thomas Thrumburg, of Anderson, Ind., is superintendent of the company.

WABASH.—Bids will be received until June 24, by the Wabash county commissioners, for the construction of a bridge over the Mississinewa river. D. Showalter, county auditor.

IOWA

DUBUQUE.—The Dubuque Boat & Boiler Works advises the fire at its plant May 14 burned out the machine and flanging shops,

which are being replaced. The company has bought all the machinery it requires.

ELDORA.—A bridge is contemplated over the Iowa river east of Eldora in section 8. It will cost approximately $35,000.

KANSAS

PITTSBURG. — The United Iron Works has started improvements on its plant here, an approximate cost of $25,000, which will permit the company to supply steam shovel repairs. The new building will be 55 x 90 feet and equipped with a traveling crane. The new equipment will include a 72-inch boring mill, a 400-ton steel press, a large size radial drill and several smaller machines. J. A. Desbonne, local manager.

TOPEKA.—St. Francis hospital will be enlarged, at a cost of $65,000. Contract awarded.

TOPEKA.—An addition to the state printing plant, to be 50 x 150 feet, four stories, will be constructed next year.

TOPEKA.—The Topeka Street Railway Co. will extend its lines west from the city limits to Gage park, a distance of about two miles. Work will start soon.

TOPEKA.—The state public utilities commission recently granted a permit to the Spring River Power Co. to issue $8,000 in bonds for the purchase of new machinery, and authorized the Empire District Electric Co. to issue $220,000 in bonds for improvement work.

TOPEKA.—The Atchison, Topeka & Santa Fe Railroad Co. recently placed an order for the structural steel necessary for a new $100,000 building at the Topeka shops. The new building will be a power house located in the main shop group, near the present main power house.

WICHITA.—The Tuttle Mfg. Co., formerly operating at Corning, Ia., has moved its machinery and other plant equipment to Wichita, to be installed in the Smyth building on North Santa Fe avenue, near Third street.

KENTUCKY

AUBURN.—The Auburn Light & Water Co., which has plans for an electric light plant under consideration, is now ready to consider bids on machinery installations.

HICKMAN.—An electric crane will be required by the Independent Coal Co., which will use it in handling coal from river barges. John T. Dillon is manager.

LAWRENCEBURG.—Machine tools probably will be needed for the automobile repair shop to be installed by the Woods-Ford Co. in the immediate future.

LOUISVILLE.—J. Frank Taylor and others have acquired the hotel property at Olympian Springs, Ky., and will improve it by the installation of a steam heating plant.

LOUISVILLE.—The J. V. Pilcher Mfg. Co., which makes a metal specialty, is considering the construction of an addition to the factory, which will probably require additional machinery.

LOUISVILLE. — The Crown Motor Car Co. has established temporary quarters at 121 North Third street, and will equip a shop for preliminary work in automobile construction. C. H. Lambert is manager.

LOUISVILLE.—The Louisville & Nashville Railroad Co. will erect a large number of new bridges on its Lexington & Eastern branch. Steel construction will prevail. About $1,000,000 will be spent in improvements on this section of the road.

PADUCAH.—The pump-boat of the West Kentucky Coal Co., destroyed by an explosion recently, will be replaced.

UPTON.—The Louisville & Nashville railroad will probably purchase equipment for the operation of a quarry and stone crusher to produce material for construction work.

LOUISIANA

NEW ORLEANS.—The Southwestern Traction & Power Co., which has under construction an extension of its lines from New Iberia, La., to Lafayette, a distance of 22 miles, has called a meeting of its stockholders for June 16 to vote on the increase of its capital stock to $3,000,000. A special meeting has also been called for June 30 to authorize a bond issue of $5,000,000.

MAINE

BANGOR.—The foundry recently bought from the H. Holton heirs, Boston, by A. C. Hopkins, Belfast, Me., will be operating shortly. It has been idle since the Duplex Roller Bushing Co. went into the hands of a receiver.

PORTLAND. — The construction of the dam and hydro-electric plant on the Presumpscot river at Dundee Falls, three miles east of Newhall station, is being rushed to completion by the Stone & Webster Engineering Corporation. The work is being done for the S. D. Warren Paper Co.

MARYLAND

BALTIMORE.—E. L. Ward has been issued a permit to build a warehouse at 410-14 Hanover street, 86 x 120 feet, six stories. Estimated cost $50,000. Plans have been prepared by E. Zielian, engineer.

HAGERSTOWN.—Efforts are to be made to reorganize the New York Central Iron Works, Hagerstown, now in the hands of receivers. A committee has been appointed to re-finance the company. It is proposed to mortgage the Hagerstown plant and sell the old plant at Geneva, N. Y.

SPARROWS POINT.—The Maryland Steel Co. will add to the electrical equipment of its plant several new motors, orders for which have been placed with the General Electric Co., Schenectady, N. Y.

MASSACHUSETTS

CHELMSFORD.—The Chelmsford Spring Co., whose plant was destroyed by fire last November, is rebuilding.

FITCHBURG. — The Fitchburg Machine Works is at present installing the machinery and other equipment in its plant on Water street, which was formerly used in the plant of the Flanders Mfg. Co., Pontiac, Mich. The Fitchburg concern will manufacture automatic screw machinery and machine products. Marcus A. Coolidge, president, and L. M. White, superintendent.

NEWBURYPORT.—The Albert Russell & Sons Co. advises it has completed an addition to its foundry giving space for a number of extra men. The foundry was built in 1907, but has been outgrown. The company does a general jobbing trade in cast iron, paying particular attention to high grade iron castings, at the same time continuing as a side line, the old Russell line of ship chandlery. Bronze and composition castings also are made and special attention given to bronze tablets.

SPRINGFIELD.—The Walsh Steam Boiler Works, Holyoke, has been awarded the contract for the construction of a stand-pipe at the Ludlow reservoir.

MICHIGAN

BENTON HARBOR.—The Acme Belting Co. is seeking a location in this city and expects to be in operation in a few weeks. It manufactures a canvas-stitched belting.

CRYSTAL FALLS.—The Bates Iron Co. has increased its capital stock from $500,000 to $1,000,000.

DETROIT. — The Goodspeed-Detroit Mfg. Co., Ltd., has been incorporated to manufacture automobile engine parts. A plant to cost $20,000 is being built on Harper avenue. C. A. Goodspeed is secretary, treasurer and general manager.

DETROIT.—The Universal Motor Truck Co. of Detroit has been incorporated under the laws of Delaware with a capital stock of $1,200,000, of which $500,000 is preferred. All stock has been sold and the company has begun the erection of a new factory adjoining its present plant and fully as large, to cost without machinery $250,000.

DETROIT.—The Fisher Body Co. has increased its capital stock from $50,000 to $1,600,000. Large extensions to the plant are contemplated, including the completion and equipping of a six-story building, of mill construction, 160 x 178 feet, at Harper avenue, which was begun last year. Another building, 113 x 120 feet, five stories, will be built and equipped, to afford additional facilities for the company's open body business. F. G. Fisher, president, and L. Mendelssohn, treasurer.

KALAMAZOO.—The Hanselman Carriage Co., whose plant was recently destroyed by fire, is planning to rebuild at once, at a cost of $100,000.

KALAMAZOO. — Foundations are being erected for a new building for the Kalamazoo Stove Co. The building will be brick, one story, 100 x 200 feet, and will be built from private plans. A. H. Dane, secretary of the company.

PETOSKEY.—The Pere Marquette railroad is making extensive improvements on its line here preparatory for the rush of the resort season. New steel ties are being laid, cement walks built and the station greatly improved.

PONTIAC.—The Pontiac Machine & Foundry Co. has been incorporated to operate a foundry with a capital stock of $3,000.

PORT HURON.—The Romeo Foundry Co., Romeo, is preparing to double the capacity of its Port Huron plant, which will give them a building 50 x 150 feet, two stories. This company makes castings for the Ford Motor Car Co., Detroit.

SAGINAW.—A branch of the Rudd Auto Top Co. of Detroit has been established in J. P. Beck's new building here. In addition to making auto tops the local plant will manufacture the "Jiffy" side curtain, the rights of which are controlled by Mr. Beck.

MINNESOTA

FAIRMONT.—The Fairmont Machine Co. has started work on an addition to its machine shop.

JACKSON.—Arrangements are being made for the improvement and installation of new

equipment in the municipal light plant. J. E. Barrett, superintendent.

MANKATO.—Plans for the laying of water mains on various streets in this city have been prepared by H. F. Blumquist, city engineer. G. Meyer is mayor.

MAPLE LAKE.—The construction of a water-works system to cost $2,000 is contemplated. The engineer in charge is the Oscar Claussen Engineering Co., Commercial building, St. Paul. C. E. Jude is president of the village council.

MINNEAPOLIS.—The Red River Lumber Co. is contemplating the erection of a new building at a total cost of $150,000. An office building will be included.

MINNEAPOLIS. — The National Mfg. & Supply Co. will erect a new factory building of brick, three stories, 50 x 200 feet, to cost $30,000. H. M. Hodge, president of the company, 218 Third street south, will take bids soon.

MINNEAPOLIS.—The Chicago, Milwaukee & St. Paul is erecting a brick and concrete addition to its paint shop 116 x 263 feet. The company has also added another stall to the roundhouse. These improvements involve an expenditure of $42,500.

MINNEAPOLIS.—The Ford Motor Co., Detroit, will erect a warehouse, office and factory building at Fifth avenue and Third street, Minneapolis, at an approximate cost of $200,000. The building will be brick, five stories, 144 x 197 feet. John Graham, 3030 Woodward avenue, Highland Park, Mich., is architect, and Kees & Colburn, Donaldson building, Minneapolis, are associate architects.

ST. PAUL.—The Board of Public Works is taking estimates on machinery for the manufacture of ice, on authority granted by the state to establish a municipal ice plant costing $250,000.

MISSOURI

KANSAS CITY.—A new building to duplicate its present nine-story plant, will probably be erected here by Montgomery, Ward & Co., Chicago, mail order house.

KANSAS CITY. — The Burns-Bowes Pie Co., Cleveland, is planning to erect a building at Twenty-second and Mullanphy streets, at a cost of $35,000. New machinery equipment will cost $10,000.

LEXINGTON. — John Walker, county highway engineer, Lafayette county, advertises for bids until June 2 for the construction of nine steel bridges in different parts of the county.

ROLLA.—Arrangements are being made for the improvement of the municipal electric light plant. O. W. Chapin, superintendent.

ST. JOSEPH.—The St. Joseph Electrical Co. has increased its capital stock from $5,500 to $15,000.

ST. LOUIS.—The Business Men's League is negotiating for the establishment of a steel mill in St. Louis. If the present plans are successful, a local screw manufacturing company will be a part of the new concern. A building site being considered at the present time is an eight and one-half acre tract, opposite O'Fallon park, two blocks north of Broadway. Albert Versen, industrial commissioner, is representing the Business Men's League.

ST. LOUIS.—The Busch-Sulzer Bros.-Diesel Engine Co. advises that its new Diesel engine plant has been completed, engines installed, and other machinery and tools ready for installation. It will be only a short time until the plant is ready for operation. Meanwhile, the Power & Mining Machinery Co., Cudahy, Wis., and the A. & B. Mfg. Co., Providence, R. I., will continue the manufacture of Diesel engines. These companies have built Diesel engines, now in operation in 26 different states, aggregating 70,000 horsepower.

MONTANA

GREAT FALLS.—The U. S. Reclamation service has awarded the contract for canal tunnels and Sun river slope on Sun river project to MacArthur Bros. Co., New York City, for $858,615.

KALISPELL.—The city council is having plans prepared for a municipal waterworks plant. F. E. Marsh, city engineer.

NEBRASKA

NORFOLK.—A bond issue of $10,000 has been voted for water-works extensions.

NEW JERSEY

BAYONNE.—A permit has been granted to the Horsley Laboratories Co., of Bayonne, to erect a two-story brick and steel factory building to cost approximately $22,000. The company was incorporated very recently to manufacture films. William Horsley has been elected president.

BAYONNE. — The American Cotton Oil Co., 27 Beaver street, New York City, has purchased a large number of city lots in the industrial section of Bayonne. While the company's purpose in acquiring the property has not been officially announced it is supposed to be its intention to utilize it for manufacturing purposes.

CAMDEN.—Ballinger & Perrot, architects, 1211 Arch street, Philadelphia, are preparing plans for a reinforced concrete factory building, 20 x 70 feet, four stories, which will be owned and occupied by Ronald & Johnson, of Camden.

HIGHTSTOWN.—The establishment of a municipal gas plant, at a cost of $25,000, is being considered by the city council.

NEWARK.—The Atlas Tool Co. will erect a brick factory and warehouse building at a cost of $31,331.

NEW MEXICO

ALBUQUERQUE.—The Santa Fe is planning to build a roundhouse and repair shop in Albuquerque, according to press reports.

NEW YORK

BROOKLYN.—J. Rokeach & Son, soap manufacturers, have bought a six-story factory building on South Fifth and Hewes streets, which will be equipped to meet the requirements of the new owners.

BROOKLYN.—The Greater New York Iron Works, Inc., has been incorporated; $3,000; by Paul Wallisch, 147 McKibben street, Brooklyn, and William Dranox and S. Sogrod, both of 69 Jackson street, New York City.

BROOKLYN.—The William P. Garry Co., 306 Freeman street, has taken a contract to erect a brick factory building for James A. McCafferty, North Ninth street. The building will be 50 x 100 feet, four stories, estimated cost $20,000.

BROOKLYN. — The Drake Baking Co. have plans for $115,000 factory which will be erected on Clinton street near Park avenue. The building will be of brick and concrete, 80 x 125 feet, five stories. Dodge & Morrison are the architects.

BUFFALO. — The Lahoony Machine Co., Inc., has been incorporated; $25,000; by J. McGillick, H. Hind and M. Murphy, all of Buffalo.

BUFFALO.—The Corrugated Bar Co., Mutual Life building, advises that it has just completed the construction of a new crane runway extension to its warehouse at Blasdell, N. Y., giving an additional stock capacity of corrugated bars of 2,000 tons, making a total capacity at its plant of 6,000 tons. Provision is made for carrying all sizes of corrugated bars, in squares and rounds, both medium and high elastic limit steel. The company also has numerous plans looking toward important additions to and modifications in its present business, but is not yet ready to give details. A. L. Johnson, first vice president.

COHOES.—Bids are being received at the New York City office of the Cohoes Electric Light Co., 2 Rector street, on a $1,000,000 power plant. The plant will be located on the Mohawk river near Cohoes Falls, N. Y.

FULTON.—The Dilts Machine Works, Inc., has been incorporated; $125,000; by F. L. Flanders, 217 Oneida street, and F. B. Dilts and B. W. Bennett, both of 145 S. First street, all of Fulton.

LONG ISLAND CITY.—Howe & Howard have plans for a one-story factory building, to be erected at the corner of Van Alst avenue, and Fourteenth street.

LONG ISLAND CITY. — The Neptune Meter Co., 90 West street, Manhattan, will add a manufacturing building to its Long Island City plant. The addition will be 72 x 173 feet, four stories, estimated cost $125,000.

LONG ISLAND CITY.—The Standard Oil Co. will make two important additions to its plant in the manufacturing district of Long Island City. A storage house 100 x 100 feet will be erected on Duryea street, and a repair shop 62 x 82 feet will be erected on Old Thomas street.

LONG ISLAND CITY. — The Cross & Brown Co. has sold to Sophie Schwagle, agent for a large manufacturing concern in Manhattan, a corner plot at Paynter avenue and the boulevard. The plot adjoins a piece of property bought by the same interest recently, and it will be used as a site for a large factory building.

LYONS.—A bond issue of $10,000 has been voted for the installation of a municipal electric light plant, plans and specifications for which are being prepared by H. G. Sweet, Utica.

NEW YORK CITY. — The Pluton Mfg. Co., Inc., has been incorporated to manufacture wrought and ornamental metals; $1,000; by Abel Maguie, Louis Schmerzler and S. Blank, all of 237 Lafayette street, New York City.

NEW YORK CITY.—The Nusbaum-Spiegel Iron Works, Inc., has been incorporated; $1.000; by Adolph Spiegel and E. Spiegel, both of 403 East Eighth street, New York City, and Isaac Nusbaum, 2961 West Twenty-third street, Coney Island, N. Y.

NEW YORK CITY.—The C. W. Hunt Co., Inc., has been incorporated to manufacture and deal in machinery for hoisting;

$500,000; by W. F. Lee, W. New Brighton, S. I., N. Y., and J. W. Hiltman and T. S. Atwater, both of 45 Wall street, New York City.

NEW YORK CITY. — The Victor M. Braschi Machinery Co., Inc., has been incorporated to manufacture engines, tools, machinery, boilers, pumps, etc.; $75,000; by Gustave Lobo, 78 Wall street, Alfred Houston and James Spiller, both of 115 Broadway, New York City.

NEW YORK CITY. — Neville & Boggs, architects, 215 West 125th street, have prepared plans for a brick factory building to be erected on Austin Place near 144th street, by the H. & F. Mesinger Mfg. Co., leather goods manufacturer. The building will be 75 x 100 feet, five stories, estimated cost $60,000.

NEW YORK.—The Stevens Aylsworth Co., Inc., has been incorporated to manufacture structural steel and iron; $10,000; by Richard G. Stevens, 114 Liberty street, New York City, William N. Stevens, 243 Brooklyn avenue, Brooklyn, N. Y., and R. P. Aylsworth, 607 Kearny avenue, Arlington, N. J.

NEW YORK CITY.—Merrall's Starter Co., 1770 Broadway, recently incorporated, advises it proposes to manufacture in iron and brass, with some aluminum, a line of air starters for automobile, motor boat and aeroplane engines, air compressors, shock absorbers, carburetors and the Merrall's steam and compressed air engine. For the present the company will have its goods manufactured outside and will assemble the specialties at its present establishment. W. A. Merralls is president and R. C. Neely, secretary.

NIAGARA FALLS.—The Niagara Falls Furnace Co. will increase its capital from $50,000 to $100,000. The plant now being constructed will be larger than at first planned and will be completed by Aug. 1. The plant capacity will be 3,500 furnaces per year.

ROCHESTER.—The Rochester Railway & Light Co. plans to erect a $20,000 addition to its plant at the foot of South Water street.

ROCHESTER.—The Rochester Bronze & Aluminum Co., Inc., has been incorporated; brass, bronze, iron and aluminum castings; $25,000; by Joseph Strauss, J. J. Keefe and E. C. Warren, all of 82 Richmond street, Rochester.

ROCHESTER.—The Rochester Railway & Light Co. is building a new power station on the river flats, south of the Platt street bridge, which will probably be completed by November. The new station will have two water wheels, each with a dynamo. One dynamo will have a capacity of 2,700 and the other 5,300 horsepower. The building will be 40 x 100 feet.

SCHENECTADY. — Among recent orders received by the General Electric Co. are the following: 500-kilowatt Curtis turbo-generator unit, from Albert Schwill & Co., South Chicago, Ill.; a 500-kilowatt Curtis turbo-generator unit, from the Hyatt Roller Bearing Co., Harrison, N. J.; one 10-kilovolt-ampere and three 150-kilovolt-ampere transformers and 14 motors, ranging from five to 100 horsepower, from the Empire Gypsum Co., Garbutt, N. Y.; three 300-kilowatt transformers and 31 motors, ranging from five to 100 horsepower, from the Baltimore Pearl Hominy Co., Baltimore, Md.; 18 motors, ranging from 15 to 400 horsepower, from the Boston Woven Hose & Rubber Co., Cambridge, Mass.; a 75-kilowatt alternator and six 25-horsepower motors, from the Avery Co., Peoria, Ill.; 10 motors, ranging from 10 to 100 horsepower, from the Grantville Oil Mill, Grantville, Ga.

SYRACUSE.—E. R. Caldwell, president of the Caldwell & Ward Brass Co., recently announced that he had sold his interest in the firm to his partner, P. B. Ward, and would organize a new foundry in this city. Mr. Caldwell will have as his partner his son, R. L. Caldwell, and the firm will be known as E. R. Caldwell & Son. The new concern will manufacture brass, bronze and silver metal castings.

WAPPINGER FALLS. — Ralph Croshier, Wappinger Falls, is fitting out a machine shop on West Main street, where he will manufacture his patent adjustable bit.

NORTH DAKOTA

KENMARE.—The Ohnstedt Mfg. Co. will establish a foundry here for the manufacture of bridge material, iron castings and a patented plow.

OHIO

AKRON.—The Diamond Rubber Co. has decreased its capital stock from $100,000 to $10,000.

AKRON.—The Akron Scrap Iron Co. has increased its capital stock from $10,000 to $25,000.

AKRON.—The Canton-Akron Consolidated Railway Co. has decreased its capital stock from $2,500,000 to $10,000.

AMHERST.—The United States Automatic Co. is awarding the contracts for an addition to its plant, 50 x 220 feet, one story, of brick and steel construction, with steel sash windows.

ASHTABULA. — The city council has granted the Lake Shore Railroad Co. 15 days additional time for the preparation of plans for the Center street subway, which is estimated to cost $300,000, of which $105,000 will be paid by the city.

ASHTABULA.—Bids for the construction of the superstructure of the Callender bridge over the Grand river, will be opened June 23, by A. V. Hillyer, clerk, board of county commissioners, Jefferson. J. S. Matson, county engineer.

BATAVIA.—The National Lathe Co. has been incorporated to manufacture lathes and other machine tools; $10,000; by A. V. Carroll, J. F. Hartman, A. Carlier, C. Carlier and B. R. Hartman, all of Batavia.

BATAVIA.—The American Milling Machine Co. at Batavia, O., has been incorporated to manufacture milling machines and machine tools. The capital stock is $10,000, but it is understood that it will be increased within a short time. P. F. Jamieson, of Batavia, is one of the principal incorporators.

BELLEVUE.—The Bellevue Illuminating & Power Co. has sold its power plant and lighting franchize to the Lake Shore Electric Railway Co. for $29,000.

CANTON.—The H. L. Hurst Mfg. Co., manufacturer of spraying machinery, has increased its capital stock from $30,000 to $40,000, to provide for a number of improvements and the purchase of additional equipment. H. L. Hurst, president.

CINCINNATI.—Stanley Struble, chairman board of commissioners, Hamilton county, will open bids June 13 for alterations for a lift bridge over the canal in Springfield township. Plans with commissioners.

CINCINNATI.—The Cincinnati Power Co. has been incorporated; electricity and steam for power, light and heat; $10,000; by Henry Bentley, W. B. Mente, C. M. Stegner, B. S. Hughes and I. Wingfield, all of Cincinnati.

CINCINNATI.—G. A. Schacht and William C. Schacht, formerly manufacturers of the Schacht motor car, Cincinnati, will reenter the automobile business, and are looking for a factory they can buy. As soon as one is obtained equipment will be installed and work started making motor trucks.

CINCINNATI.—Sealed proposals for the construction, delivery, and erection of one 7,000,000-gallon triple-expansion crank and flywheel pumping engine, for the high-service system at the Western Hills Pumping Station, water-works department, Cincinnati, will be received until June 4. V. T. Price, director of public service.

CINCINNATI.—The W. F. Robertson Steel & Iron Co. recently purchased the entire plant of the J. A. Meeks Co., Muncie, Ind., and has shipped all the machinery and accessory tools to the Cincinnati plant. This will considerably increase the company's output, and will enlarge the range of the sizes of rivets which the company manufactures. The machines are now being set up and will be ready for operation in a short time.

CINCINNATI.—From all indications the United States Sheet & Culvert Co., of Birmingham, Ala., will shortly locate in Cincinnati. The company has a capitalization of $1,000,000 and manufactures metal street covers and corrugated culverts. Officers of the company are looking for a factory site, and while it is acknowledged that several other cities are being considered it is more than likely that Cincinnati will be selected. The company plans to have a floor space of about 100 000 square feet.

CLEVELAND.—The Van Dorn & Dutton Co. has increased its capital stock from $150,000 to $350,000.

CLEVELAND. — The city council has passed an ordinance authorizing an expenditure of $96,000 for equipment for the municipal electric light plant.

CLEVELAND.—Sealed proposals for the erection of the structural steel work on the Lower West Third street bridge, will be received until June 10. Plans and specifications at the office of the chief engineer. W. J. Springborn, director public service.

CLEVELAND.—The Manhattan Spring & Bed Co., New York City, will establish a branch plant here, having leased 10,000 feet of floor space at 2104 Woodland avenue, with the option of renting two additional floors if business warrants.

CLEVELAND.—The Detroit Iron & Steel Co., Cleveland, a subdiary of M. A. Hanna & Co., advises extensive improvements are being made at its Detroit plant. A steel trestle and steel ore and coke bins are being substituted for wood at the "A" furnace, where a Mullins gas washer also is being installed. The concrete ore dock is being extended 100 feet and a brick and steel machine shop and brick and steel store house are being built.

COLUMBUS.—The Columbus Bolt Works has recently been granted a permit for the construction of a steel addition to cost $7,500. The McClintic-Marshall Co., Pittsburgh, has the contract.

DAYTON.—Bids will be called soon for the

proposed temporary Fifth street bridge, estimated to cost $10,000.

FINDLAY.—A bond issue of $57,000 for the construction of a municipal electric distributing system will be voted upon June 3. J. W. S. Riegle, engineer. (Noted May 1.)

FOSTORIA.—The Allen Motor Car Co. has been incorporated; automobiles; $500,000; by E. W. Allen, W. O. Allen, M. A. Thomas, O. P. Barnhart, J. E. Wright, G. E. Scroth, R. J. Christy, G. H. Baker and H. C. DeRan, all of Fostoria.

HAMILTON.—Bids will soon be called for the construction of the High and Main street bridges.

KALIDA.—The Kalida Electric Light Co. has been incorporated; $10,000; by J. E. DeVoe, S. E. Shipp, A. B. DeVoe, P. E. DeVoe and H. D. Grindle, all of Kalida.

MENTOR. — The Mesaba Steamship Co. has decreased its capital stock from $940,000 to $9,400.

NEWCOMERSTOWN.—The Rex File & Saw Co. has started the erection of an addition to its plant, 54 x 100 feet, which will be used as a forging room. Equipment will include four hammers.

OBERLIN.—Agitation over lighting rates point to the construction of a municipal light and power plant.

TOLEDO.—The Holderman Machine Co., formerly located on Walnut street, has obtained larger quarters in the Toledo Factories building.

TOLEDO.—The Lewis Foundry Co. has been incorporated; $10,000; by G. L. Lewis, W. M. Fitzgerald, L. E. Glass, J. N. Detzer and C. L. Lewis, all of Toledo.

TROY.—J. B. McCoole has been appointed receiver for the Troy Foundry Co., the suit being filed by E. E. Thompson and other stockholders of the company. The application was made in order to continue the foundry as a going concern. The losses sustained by the recent floods are assigned as a cause for the receivership proceedings. A year ago the company sustained a loss of $20,000 by fire.

WARREN. — The Warren Forge & Tool Co. will start work at once on the new addition to its plant. The company is rushed with orders and is running on double time. Another large sledge machine is being added to the equipment.

YOUNGSTOWN.—The Brier Hill Steel Co. has ordered several electric motors from the General Electric Co.

YOUNGSTOWN. — The Trussed Concrete Steel Co. recently purchased 17 acres on Albert street, adjoining its present plant, to provide for extensions. Plans are already under consideration.

ZANESVILLE.—The circuit court has confirmed the decision of this city to issue bonds for the sum of $363,000 for the construction of the new water-works system. The council will act promptly in the matter of providing a water supply.

OKLAHOMA

CHICKASHA.—The Hart Cotton Machine Co. has been incorporated; $30,000; by J. L. Hart, R. W. Wooten, B. P. Smith and E. F. Johns, all of Chickasha.

OREGON

MEDFORD. — The Beaver Portland Cement Co., recently organized with a capital of $600,000, has signed a contract with the Rogue River Public Service Corporation, successor to the Rogue River Canal Co., whereby the latter company is to supply 2,000 horsepower electric power a month during the next three years for the operation of the cement plant. The contract for the construction of the cement plant, to cost $500,000, has been awarded to the Lehigh Pump Engineering Co., Kansas City.

PORTLAND.—Four steel bridges will be built across the Powder river by the Sumpter Valley railway to replace wooden structures, according to General Manager Guy L. Anderson.

PORTLAND.—The Pacific Iron Works, which, for the past 16 years, has been located at East Third and East Burnside street, will move to a six-acre site on East Thirty-ninth street, within the next six months. According to a statement by O. E. Heintz, president and manager of the company, the new plant will consist of a steel structural shop, 60 x 600 feet, foundry, 60 x 200 feet, machine shops, 60 x 200 feet, and pattern shop, 50 x 100 feet. The new plant will enable the company to double its present production.

SALEM.—The Santiam Water Co. has been organized with a capitalization of $300,000 to supply this city and other neighboring towns with water.

SALEM.—The state desert land board has issued instructions to Chief Engineer O. Laurgaard to begin work at once on Tumalo project in Crook county, for which last legislature appropriated $450,000.

SALEM.—Plans for the Teal irrigation district to cost $1,000,000 have been filed with State Engineer Lewis by W. B. Hinkle and J. T. Hinkle. The canal will be 20 miles long.

PENNSYLVANIA

ALTOONA. — Blair county commissioners met recently at Hollidaysburg, and awarded contracts for the construction of public bridges in different parts of the county, approximating $40,000.

ARNOLD.—The Aluminum Co. of America is to furnish bond to the city that the ends of several streets running through land recently purchased for enlargement of its works will be used only for the extension of the works provided the city vacates them. It is proposed to erect a plant for the production of aluminum foil.

BRISTOL.—The Eddington Electric Co. has been incorporated; $5,000; by C. N. Martin, M. J. Hill, Bristol, and W. E. Ervin, Boothwyn.

BRISTOL.—The Township of Bensalem Light & Power Co. has been incorporated; $5,000; by D. A. Elias, H. H. H. Poole and R. J. Blanch, all of Bristol.

COATESVILLE.—The Worth Bros. Co. has ordered a new 750-kilowatt Curtis turbo-alternator from the General Electric Co.

ERIE.—The Erie City Iron Works has sold to the Standard Tin Plate Co., Canonsburg, Pa., an 18 x 24-inch four-valve engine to be direct connected to a 200-kilowatt generator. Another recent sale is a similar engine for the Mammoth mines of the H. C. Frick Coke Co., in Westmoreland county, Pa., which has been installed.

GREENSBURG.—The Greensburg Coal Co. has ordered structural steel head frames and a number of plate steel tanks from the William B. Scaife & Sons Co., Pittsburgh.

HAMBURG. — Hahn Bros., operating the auto truck and carriage works, South Fourth street, are making extensive improvements to their plant. An additional building is being erected, which will be equipped with a steam hammer.

HARRISBURG.—Papers have been filed for the merger of the Trenton, New Hope & Lambertville, Yardley, Morristown & Trenton, Newton & Yardley and Bucks County Electric railways, into the Bucks County Interurban Railway Co., Philadelphia, to operate in Bucks county; $1,000,000; by W. F. Snyder, W. H. Snyder, S. L. Wright and W. R. Wright, Philadelphia; John Barbey, Reading; Frederick Battles, Newton Square; Gaylor Thompson, Trenton.

HAZELTON.—The new plant of the Weatherly Iron & Steel Co. was placed in operation recently.

MEADVILLE.—Ten double boring machines are going through the works of the Barrett Machine Tool Co., Meadville, destined for the New York Air Brake Co., at Watertown, N. Y. Recent shipments have been made to Spain, France and Sweden.

MEADVILLE. — The William H. Page Boiler Co., Meadville, is adding a core room 50 x 110 feet, of brick, saw-tooth construction, to its plant here. New core ovens are to be installed and a hand traveling crane is to be put in.

PHILADELPHIA.—The West Caln Electric Co. has been incorporated; $5,000; by H. T. Hartman, H. C. Swan, Bristol, and J. A. Slattery, Philadelphia.

PHILADELPHIA.—The General Engineering Co. advises its new building is to be used as a machine, boiler, blacksmith and pattern shop. All equipment and machinery have been bought.

PITTSBURGH.—The Carnegie Steel Co. has ordered two 400-horsepower motors for its Homestead Steel Works from the General Electric Co.

PITTSBURGH.—The George J. Hagan Co., Peoples Bank building, has taken a contract for sheet pair and annealing furnaces for the Allegheny Steel Co., Brackenridge, Pa.

PITTSBURGH.—The E. M. Wichert Co. has taken out a charter for general engineering and construction work. E. M. Wichert, Wilkinsburg, is at the head of the company.

PITTSBURGH.—The Pittsburgh Screw & Bolt Co.'s plant is nearing completion. The building is approximately 400 x 900 feet. The old section formerly was occupied by the Riter-Conley Mfg. Co.

PITTSBURGH.—The Des Moines Bridge & Iron Works Co. has bought a tract 356 x 477 feet adjoining its plant on Neville Island, Pittsburgh, and will erect additional buildings thereon at once, giving a large increase in capacity.

PITTSBURGH. — Damage of $10,000 was done by fire last week to the plant of the Waynesburg Pressed Steel Co., West Waynesburg, Pa. Loss is principally in damage to machinery and through suspension of operations.

PITTSBURGH.—Two boilers of 127 horsepower capacity each have been sold by the Babcock & Wilcox Co., Farmer's Bank building, to the Baltimore & Ohio railroad for installation in the station at Pittsburgh. Chain grate stokers will be used.

PITTSBURGH.—The Babcock & Wilcox Co., Pittsburgh, has taken a contract for 1,000 horsepower of boilers for the Brilliant pumping station at Pittsburgh, for the department

of public works. Murphy stokers will be used.

PITTSBURGH.—Four new coal mines are to be opened by the Montour railroad of the Pittsburgh Coal Co., three near Thompsonville and one near McPherson's Mills, Pa. They will be equipped with modern machinery. The output will be for lake shipment over the Montour and Bessemer & Lake Erie roads, giving a new and lower net rate. The mines will not produce before next year.

PITTSBURGH.—The West Penn Traction Co. reports rapid progress of the water power plant of the Hydro Electric Co., near the Cheat river, W. Va. An initial installation of 4,800 horsepower will be ready Jan. 1, 1914. Ultimate capacity will be 15,000 horsepower. This power development will result in a decrease in the cost of operation of the West Penn properties and may result in cheaper power for iron and steel mills. coal mines, etc., in the Pittsburgh district.

PITTSBURGH.—Increase of 60,000 kilowatts at the Brunot's Island power plant of the Pittsburgh Railway Co. is being provided. Twenty Sterling boilers of 822 horsepower each are to be furnished by the Babcock & Wilcox Co., Pittsburgh, to be erected in batteries of five with a 14 x 180-foot stack for each battery. The Westinghouse Electric & Mfg. Co. is to furnish four tube generators of 15,000 kilowatt capacity each and the Worthington Pump Co. is to furnish pumps and condensers.

PITTSBURGH.—New Pittsburgh incorporations are as follows:

Pittsburgh Haynes Automobile Co.; $10,000; by Harry S. Morrow, Ella K. Morrow, Latrobe; Alvah Hughson, Pittsburgh; Tri-state Coal & Coke Co.; $10,000; by R. M. Jenkins, Coraopolis; S. F. Barth, Emsworth; J. M. Berkey, Pittsburgh; Copper Die Horseshoe Co.; $10,000; by W. B. Miller, A. E. Garvin and C. M. Garvin, Pittsburgh; American Cotter Pin Co.; $50,000; The Wallace Automatic Belt & Rivet Machine Co., Delaware, to manufacture and sell automatic bolt and rivet machines and accessories; $100,000; by W. F. Dowerman, W. A. McCoy, Pittsburgh; J. T. Wallace, St. Louis.

SANDY LAKE.—The Sandy Lake Power Co. has been incorporated to operate in Mercer county; $5,000; by W. F. Jaxtheimer, A. R. Carrier and James George, all of Greenville.

SHARON.—The Petroleum Iron Works Co. has been awarded the contract for two penstocks, each 14 x 600 feet, to be erected for the Shawinigan Falls Water & Power Co., at Shawinigan Falls, Que.

SHARON.—The Pressed Steel Products Co. will soon have its new plant completed and expects to start operations within a couple of weeks. This company will manufacture steel barrels.

SOUTH BETHLEHEM.—The Bethlehem Steel Co. has awarded a contract to George A. Hardener, Allentown, Pa., for a $50,000 power house for the company's proposed locomotive repair shop.

STONEBORO.—The Stoneboro Power Co. has been incorporated to operate in Mercer county; $5,000; by W. F. Jaxtheimer, A. R. Carrier and James George, all of Greenville.

YORK.—The York Mfg. Co., manufacturer of refrigerating machinery, advises that a large number of installations during the past month have been made, including the installation of a 175-ton vertical single-acting refrigerating machine, with Corliss engine and high pressure side complete, for the Central Ice Mfg. Co., Boston, Mass.

TENNESSEE

MEMPHIS.—The Chickasaw Machine & Foundry Co. has filed application for charter with a capital of $20,000.

MEMPHIS. — A garbage incinerator may be purchased by the city. Address the superintendent of the board of health.

NASHVILLE.—The foundry of Fort & Son was recently damaged by fire.

SPRINGFIELD.—Proposals for the construction complete, including mechanical appliances, of the United States post office, at Springfield, will be received until July 2 by O. Wenderoth, supervising architect, treasury department, Washington, D. C.

TEXAS

BEAUMONT.—The Southern Well Works, Chattanooga, Tenn., is preparing plans for additions to its machine shops at Beaumont. Eugene Kibele, general superintendent, and N. Lucey, local manager.

BEAUMONT. — Construction work has started on the machine shop and auxiliary building of the Texas & New Orleans railroad in Beaumont. Estimated cost of the buildings and equipment, $65,000.

DALLAS.—The management of the Southern Traction Co. is reported to be planning the construction of machine shops in the southern part of Dallas.

EL PASO.—Otto P. Kroeger & Co. have been awarded the contract for the erection of the First National Bank building, seven stories, reinforced concrete construction, estimated to cost $200,000.

GALVESTON. — The Rockwall Light & Power Co. has been incorporated; $25,000; by Hiram Grosman, M. Grosman, W. C. Woodlief, W. D. Austin and W. F. Leonard.

HOUSTON.—A proposed bond issue of $1,200,000, for the construction of new bridges and street improving, will come to vote July 1.

VERMONT

RUTLAND.—The Rutland Railway, Light & Power Co. is planning the development of 4,000 horsepower on East creek. This is one of a number of developments covering a large area to be controlled by the Western Vermont Power Co., New York City. I. M. Frost, Rutland, manager, and Henry F. Bryant, 334 Washington street, Brookline, Mass., engineer.

VIRGINIA

LYNCHBURG. — The Lynchburg Foundry Co. has been awarded the contract for furnishing 4,000 feet of 12, 10 and 6-inch cast iron water pipe at $24.40 per ton, f. o. b. Holyoke, by the board of commissioners, Holyoke, Mass.

RICHMOND.—The Southern Gas & Electric Corporation has been incorporated; $2,000,000; by J. T. England, president; Alexander H. Sands, secretary; W. H. Hudgins, first vice president; E. L. Reiha, second vice president; Perry Seay, treasurer.

WASHINGTON

ABERDEEN.—Incorporation papers for the Czette Railway Co. have been filed here with capital stock of $50,000. Alex Polson and R. D. Merrill, incorporators.

CONCONCULLY.—The Washington Consolidated Mines & Reduction Co. has been incorporated for $2,250,000 by William Baines and C. H. Neal and others.

DAVENPORT.—The board of county commissioners will receive bids June 4 for four steel bridges, 100, 80, 60 and 40 feet long. Three will be of bowstring truss type and the smaller one simple beam type.

DEER PARK.—A company to build a $25,000 flour mill has been organized to begin operations at once. Joseph Miller, W. A. Mill, William Calhoune and G. L. Baker, general manager, are the incorporators.

GARFIELD.—The voters have authorized bond issue of $14,350 to build sewer system and septic tank.

NORTH YAKIMA.—The people will vote July 8 for sewer system that has been estimated to cost $240,000.

PORT ANGELES.—The Portland Bridge Co. was the low bidder for the construction of a steel and concrete bridge over the Elwah river with its offer of $20,990. Work will begin at once.

SEATTLE.—City engineer has recommended purchase of Lake Cushman power site at a cost of $650,000 for hydro-electric power plant.

SEATTLE.—The board of public works will receive bids June 13 for construction of Cedar river masonry and steel dam for auxiliary power plant.

SEATTLE.—The foundry of the Westerman Iron Works, at Lander street and Whatcom avenue, was badly damaged by fire recently.

SPOKANE.—The Checop Mining Co. has been incorporated for $1,500,000 by John B. Cooke and F. H. Hunter.

TACOMA.—The city council has passed initial resolutions giving its intention to lay cast iron water mains in 45 city blocks. Improvement will be up for remonstrance soon.

VANCOUVER.—The Clarke County Iron Works recently installed a 600-pound steam hammer for heavy forgings and welding work. This company derives its principal revenue from logging machines and castings for manufacturing plant.

WEST VIRGINIA

CLARKSBURG.—The plant of the Clarksburg Lumber & Planing Mills Co. was badly damaged by fire recently, the loss amounting to approximately $50,000.

CLARKSBURG. — The waterworks board contemplates enlarging the city filtration plant, at an estimated cost of $40,000. Improvements likely to be made this summer.

FAYETTE.—The Fayette Traction Co. has increased its capital stock from $50,000 to $75,000.

PARSONS.—The Parsons Electric Co. has been incorporated to furnish electricity and to build dams, etc.; $25,000; by J. B. Van Wagener, Byron Trimble and Alexander Murdock, Pittsburgh, C. W. Scheck, Mt. Lebanon, Pa., and J. A. Lynch, Swissvale, Pa.

RAVENSWOOD.—A franchise for an electric light plant at Ravenswood has been

granted to J. M. Caldwell, Parkersburg. Plans are being prepared.

WHEELING.—The stockholders of the Wheeling Traction Co. recently voted to secure a loan of $10,000,000 to provide for the extension of its lines on both sides of the Ohio river. New equipment and the transmission of power from the hydro-electric generating plant on Cheat river, near Morgantown, are provided for. G. O. Nagle, general manager.

WISCONSIN

ANTIGO. — The Holland Flexible Auto Wheel Co. has been incorporated to manufacture rims, wheels, etc.; $1,000; by J. L. Donohue, J. E. McKenna and T. J. Holland, all of Antigo.

ANTIGO.—Priebe Bros., manufacturers of cornices and other ornamental sheet metal products, have broken ground for a new plant to cost $10,000. The main building will be 44 x 80 feet.

ASHLAND.—Dredging at the site of the Reiss coal dock is progressing rapidly, operations having been carried on continuously during the past week or ten days. When the work is finished the dredges will begin work at the new Northwestern dock. The work is being done by the Northwestern Dredge & Dock Co. of Duluth.

BELOIT.—The Berlin Machine Works, woodworking and sawmill machinery, is preparing to build a large addition according to plans prepared by Perkins, Fellows & Hamilton, 6 N. Clark street, Chicago. The building will be 275 x 294 feet, two stories, of steel, pressed brick and stone construction, with saw-tooth roof.

BELOIT.—The Wisconsin Farm Implement Co., organized by George B. Slater and George W. Marsden at the time of the sale of the Slater, Marsden & Whittemore Co., punches, shears, rolls and wood-working machinery, Beloit, to Thomas C. Hendley, has purchased an acre adjoining its present holdings in South Beloit, and will erect a concrete factory building, 40 x 48 feet.

CHILTON.—The Calumet Brewing Co. is preparing to build a new brewing and malting plant on the site of the present brewery. The structure will be erected this year. The equipment will be new throughout.

EAU CLAIRE.—The corporation organized at Moose Jaw, Sask., to manufacture road and field tractors in Canada under license from the Phoenix Mfg. Co., of Eau Claire, Wis., is planning to construct a main factory 80 x 120 feet, employing 100 men.

FOND DU LAC.—Edward M. McGowan is contemplating the organization of a company to manufacture automobile devices of his design, which include an automatic fender or shield operated by springs.

FOND DU LAC.—Bondholders of the Harris Typewriter Co., represented by Fred J. Rueping, Fond du Lac, bid in the personal and real property of the company at foreclosure sale at $60,000. The purchasers will reorganize at once and continue the manufacture of typewriters and other devices.

KENOSHA. — The city is contemplating the erection of a purification plant, which will cost between $150,000 and $200,000.

LA CROSSE.—The Chicago Steel Tape Co., Chicago, has decided to relocate its works and upon the purchase of a large interest in the company by W. S. Woods, of La Crosse, has decided upon this city as the new location. The Hogan building at 122-124 South Front street, has been leased and is now being remodeled for factory purposes.

MADISON.—The Masonic Union of Madison, is planning the construction of a new Masonic temple, of at least seven stories, 80 x 150 feet. Steel construction will be used.

MENASHA.—The J. E. Hill & Sons Construction Co. has been awarded the contract for six electric motors and a miscellaneous list of small machinery for the plant of the Eureka Cooperage Co., which is about to resume operations.

MENOMONEE FALLS.—The Nelson Foundry Co., Milwaukee, gray iron, will establish its foundry plant at Menomonee Falls if citizens will provide a site. The Nelson foundry at Thirty-fourth and Commerce streets, North Milwaukee, was destroyed by fire several months ago. The new plant is to be 100 x 200 feet, of reinforced concrete, with coke, iron and sand sheds adjoining. The daily capacity of the cupola will be 6 tons.

MILWAUKEE.—Irving McC. Bean, president of the Milwaukee Boiler Co., has organized the Monarch Boiler Arch Co., capital $25,000.

MILWAUKEE.—The lease made by Max Goldstine of the property on Third street, between Grand avenue and Sycamore street, Milwaukee, from S. A. Tolman, Chicago, has been ratified by the Milwaukee courts and plans are being prepared for a hotel building of not less than 10 stories, of steel and enameled tile construction, costing approximately $350,000.

MILWAUKEE.—The Wisconsin Telephone Co., 183-187 Fifth street, will spend $35,000 in the construction of new trunk lines and modern improved call equipment in the Milwaukee district. F. M. McEniry is commercial superintendent.

PESHTIGO.—The Wisconsin & Michigan Railroad Co. is substituting electric motors for steam drive throughout its machine shop at Peshtigo.

RACINE.—The Racine Detachable Hinge Co. has been incorporated to manufacture hinges, etc.; $16,000; by William R. Taylor, A. J. Piper and F. W. Heeter, all of Racine.

RACINE. — The Winkler Engineering Co. has been incorporated to do a general manufacturing and engineering business; $15,000; by A. E. Winkler, V. H. Whaley and W. E. Walker, all of Racine.

RACINE.—The Racine Water Co. is preparing estimates for the installation of a filtration system to purify the water supply, taken from Lake Michigan. The probable cost is $25,000.

RACINE.—W. R. Taylor, 2827 Washington avenue, has purchased the manufacturing rights to hinges and latches designed by M. Klein and C. Heater, of Racine, and proposes to establish a factory.

TWO RIVERS.—The Standard Aluminum Co., Two Rivers, which recently decided to establish a complete rolling mill in connection with its foundry and stamping plant, has increased its capital stock from $100,000 to $250,000. Work on the mill structure has already started.

WAUSAU.—Fred K. Krause, of Wausau, was awarded the contract for the construction of buildings for the Wausau Brewing Co., Wausau, at $44,500. Nicholas Vesser, architect, Wausau, is in charge of equipment lists. John Klug is secretary of the company.

WEST ALLIS.—The mason work has been started on an addition to the foundry of the North End Foundry Co. The building will be brick, one story, 60 x 82 feet.

DOMINION OF CANADA

ALBERTA

CALGARY.—The Pioneer Tractor Co. is erecting an assembling room for its various farming machinery, 580 feet long.

CALGARY.—Preliminary estimates of the cost of bridges over the Bow river have been prepared by the city engineer, who places the figure for the five concrete structures at $1,475,000. There will be a single deck high level bridge at Center street, costing $520,000, one at Ninth street costing $184,000, one at Fourth street costing $320,000, one at Fifteenth street costing $353,000, and the Mission bridge across the Elbow river to cost $80,000. The council will decide soon whether steel or concrete will be used.

EDMONTON. — A large machinery warehouse will be erected in Edmonton by the Rumely Products Co.

EDMONTON.—Details in regard to Edmonton's water supply system show that the pumping station will be located nine miles up the river where the water will be pumped and filtered and then brought over seven miles. The cost is estimated at $3,140,000. Mr. Latornell is city engineer.

MEDICINE HAT.—The ratepayers of this city voted on Friday, May 23, in favor of granting a street railway franchise to Sir Max Aitken, Montreal.

BRITISH COLUMBIA

ESQUIMAULT.—Esquimault is contemplating solving its sewage problem at an estimated cost of $500,000. Plans are being prepared.

PORT MOODY.—A large lumber mill will be built for the Vancouver Timber Trading Co., with a daily capacity of 200,000 feet. There will be an electric light and power station.

PRINCE RUPERT. — A steel bridge is planned by Prince Rupert municipality to be built over Morse river. It will cost $35,000. W. G. Mason is city engineer.

SOUTH VANCOUVER. — A 1,000,000-gallon pump will be purchased by the Water and Light Committee which will also construct a 100,000-gallon tank and a 750,000-gallon steel standpipe.

VANCOUVER. — The Canadian Northern railway has awarded the contract for the erection of car-building works at Port Mann, B. C.

VANCOUVER.—The Canadian Pacific railway will erect a new store building in its False Creek yards for the sleeping and dining car departments. The buildings, which will cost $70,000, will include complete refrigerating installation, etc.

VANCOUVER. — Six huge steel girders, weighing 27 tons each and said to be among the largest used in a western building, will be used in supporting the four stories over the gymnasium of the new Y. M. C. A. build-

ing in Vancouver. The general construction will be of reinforced concrete and steel.

VANCOUVER ISLAND. — The wooden bridges on the Esquimault and Nanaimo railway on Vancouver island between Victoria and Wellington will be replaced by 12 steel structures of the most modern type.

VICTORIA.—A new depot for the marine and fisheries department of the Dominion government will be built in Victoria at a cost of $150,000.

MANITOBA

RUSSELL.—A by-law to raise $18,000 for the purpose of building an electric light and power plant was passed by the ratepayers last week.

SWIFT CURRENT. — The Swift Current council is contemplating the construction of a 100,000,000 gallon capacity dam to afford a water supply. City Engineer Mackie is going into the problem with a representative of the Ambursen Construction Co., of the United States.

NEW BRUNSWICK

MONCTON.—Hugh Cameron & Co. have been given the contract for supplying a Waterous motor-driven pumping fire engine at $10,675.

ST. JOHN. — The McLeod Milling Co., Stratford, Ont., is contemplating the erection of a flour mill here or at Fredericton, N. B.

ST. JOHN.—The city will shortly be in the market for an incinerator costing around $50,000. Commissioner Agar of the public works department has the matter in hand.

ST. JOHN.—A contract for water-works supplies at a cost of $8,700 has been given by the city council to John Birch Co., London, Eng.

NOVA SCOTIA

KENTVILLE.—A water system extension at a cost of $15,000 is planned by the town council. J. Carroll, town clerk.

SYDNEY. — George Hughes, representative of the Anglo-Canadian Co., of London, Eng., who was in Sydney in March looking into the possibility of establishing ship building and other industries here, has communicated to the board of trade a proposal from his company. It sets forth that the company is willing to organize a firm with $2,000,000 capital to erect a plant capable of building ships up to 10,000 tons, providing the city gives a free site with water frontage and a guarantee of the interest on $2,000,000 6 per cent preference shares.

ONTARIO

BRANTFORD. — The Waterous Engine Works Co. has secured a contract from Moncton, N. B., for a Waterous motor-driven pumping fire engine at $10,675.

BRANTFORD.—A charter of incorporation has been obtained by Brantford Machine & Foundries, Ltd., capitalized at $40,000, with Herbert B. Rowell, Carl B. Smith, and Wm. R. Hollinrake as provisional directors.

BRANTFORD.—George A. Edgin, assistant superintendent of the Duff Mfg. Co., Pittsburgh, was here recently looking for a site on which to build a branch Canadian plant for the manufacture of jacks. The firm will build a machine shop and assembling room.

DUNDAS.—The Hydro-Electric Commission of Ontario has prepared plans for the erection here of a sub-station of brick and steel, with necessary equipment.

FORT FRANCIS.—The International Hematite Co., which has been prospecting and developing on the new iron range district east of Fort Francis, is arranging for the installation of four diamond drills at once. An expert from the Cayuna iron range in Minnesota has arrived, and will direct operations. Another iron range three miles north of Fort Francis is being explored with a diamond drill.

FORT WILLIAM.—The Maritime Nail Co. Ltd., the firm which has agreed to establish a plant at Fort William worth $600,000, has increased its capital stock from $250,000 to $3,250,000.

HAGERSVILLE. — The installation of a hydro-electric transformer station at Hagersville is contemplated by the Ontario Hydro-Electric Commission, Toronto. Three 600-horsepower transformers will be required.

HAMILTON.—The city council has passed a by-law for $150,000 for water-works improvements to include $50,000 for new services; $1,000 for hydrants and $10,000 for meters and installations.

HAMILTON.—The Gartshore-Thomas Pipe & Foundry Co., of Stuart street, Hamilton, Ont., is building a $5 000 addition to its plant. The Hamilton Bridge Works Co. has the contract for the iron and steel.

HAMILTON.—The Ontario Pipe Line Co. announces that it has completed arrangements to build 80 coke ovens in this city on a site of 28 acres, producing 7,500,000 feet of gas per day, which will be sold in the city. Estimated cost of the plant is around $1,500,000.

JORDAN.—The A. K. Wismer Carriage Co., Ltd., has been incorporated, capitalized at $40,000, with Albert K. Wismer, Morgan Wismer, E. C. Snure and others as provisional directors, to manufacture vehicles propelled by power or otherwise.

KINGSTON.—The Hydro-Electric Commission of Ontario has been asked by the Kingston Civic Utilities Committee to furnish information regarding the cost and maintenance of an urban electric railway from Kingston to Cornwall.

LONDON.—The sum of $442,573 has been appropriated for the electrification of the London & Port Stanley railway.

LONDON.—Special new machinery and a new heating system will be installed by the Dennis Wire & Iron Co. in connection with extensions to its plant.

MERRICKVILLE.—On Thursday, June 5, the ratepayers will vote on a by-law to grant a loan of $7,000 to the Percival Plow & Stove Co., Ltd. If the by-law passes, this company will move its foundry from Newburg, Ont., here, and will make considerable additions.

NEW LISKEARD. — The Wabi Iron Works, which has just completed a large addition to its plant, is preparing to erect a wood-working shop, and a vault for storing patterns, plans for which have been prepared by Mr. Teurk.

OTTAWA.—The Bow, McLachlan Co., Ltd., has been awarded a contract by the Railways and Canals Department for a steel screw lightship costing $127,384.

OTTAWA.—The Ottawa Electric Railway Co. is double tracking its line on several streets of the city this year as well as building a new line on Queen street.

OTTAWA.—Plans are being prepared for the erection of a printing plant to cost $40,000 for the Lowe-Martin Printing Co., Albert street.

OTTAWA.—The Ottawa Light, Heat & Power Co., at a meeting last week, authorized an issue of $800,000 additional stock which will increase the total capital stock from $2,000,000 to $2,800,000. The extra capital will be used to build and equip a new gas plant which the company is erecting in Ottawa East, as well as improvements to the electric lighting and power plant in the city.

OTTAWA.—The refinery at the Royal Mint at Ottawa will be enlarged so as to permit the refining of the whole gold production of Canada, the larger proportion of which now goes to American plants. The announcement has been made in parliament by the minister of finance who has, however, refused to transfer the silver refining industry of Canadian silver from the costly American plants already in operation.

OTTAWA.—Bylaws of the city of Ottawa have been authorized by the Ontario legislature to provide for the city's share of the cost of erection of a steel and concrete addition to Howick hall, $12,000; for fixtures, equipment and apparatus for new bacteriological laboratory, $10,000; for boring artesian wells, $15,000; for completion of the high pressure water plant, $35,000; for changing present two-phase system of electric light distribution to three-phase system and building storehouse, $150,000; for water main extensions and new services, $78,000; for installing flush valves, $4,000.

OTTAWA.—The annual supplementary estimates for Canada, brought down by the minister of finance in parliament last week, include large appropriations for public works in which much iron and steel will be required. Some of the items are as follows: $250,000 to begin work on the Trent canal from the Severn river to Lake Simcoe, which will eventually cost $1,000,000; $500,000 each for dry docks at Halifax and Esquimault; $200,000 for harbor improvements at Port Arthur and Fort William; half a million each for further harbor works at St. John, Vancouver, Victoria and Toronto and $600,000 further for Victoria harbor. The Ottawa votes include $25,000 for fittings for the departmental buildings; $10,000 for improvement to heating apparatus of same buildings; $55,625 for fire protection; $75,000 for re-wiring in buildings; $10,000 for new telescope for Dominion observatory. The sum of $4,000,000 is set aside for the construction of terminal grain elevators.

PETERBOROUGH.—City Engineer Parsons will prepare specifications for a bridge to cross the Otonabee river at Dalhousie street. The people will be asked to spend $65,000 on the bridge.

PORT DOVER.—Port Dover will vote on a by-law shortly for the installation of a new hydro-electric system.

RENFREW.—A commencement was made this week on the construction of a new plant for the Renfrew Electric Goods Co., manufacturer of radiators, electric irons, and other specialties. The company has operated some years at Ottawa, Ont., but is building its new plant, 40 x 110 feet, two stories, at Renfrew. T. A. Low, Renfrew, is the leading shareholder.

STRATFORD.—The Stratford Mill Building Co., Ltd., has increased its capital from $200,000 to $600,000.

TILLSONBURG. — An industrial by-law granting aid to the Tillson Electric Car Co., Ltd., was carried recently by a large majority.

The company has already started building operations.

TORONTO. — The Lumen Bearing Co., West Toronto, has broken ground for a substantial addition to its plant.

TORONTO.—The Metallic Roofing Co., of Toronto, will build an addition to its factory at a cost of $12,000. Curry & Sparling are architects.

TORONTO.—Dyer Fence & Supply Co., Ltd., has been incorporated to manufacture iron and wire fencing, machinery, etc.; $40,000; by Edward L. Dyer, Wm. Huth and Charles P. Huth.

TORONTO.—The Board of Control contemplates the installation of 60 hydrants and the purchase of three new chemical fire extinguishers for fire protection for Toronto Island.

TORONTO. — A general meeting of the shareholders of the Dome silver mine was held in Toronto on May 27 to ratify an increase in capital from $3,500,000 to $5,000,000 which will be used to finance extensions and further development.

TORONTO.—The Richelieu & Ontario Navigation Co. will, it is announced, absorb the Collingwood Ship Building & Dry Dock Co. with the ultimate intention, it is understood, of absorbing all the dry docks on the great lakes. The Collingwood Co. is capitalized at $800,000.

TORONTO.—Tenders will be received by the Hon. Adam Beck, chairman of the Hydro-Electric Commission, Continental Life building, until June 16, for the construction of a reinforced concrete power house and a concrete dam at Wasdell's Falls on the Severn river. Plans and specifications from the offices of the commission, W. W. Pope, secretary.

TORONTO.—Tenders will be received until June 23 by R. C. Desrochers, secretary of the Public Works Department, for the following work on the New Barracks property near Toronto: Water-works pipe laying and sewer pipe laying, pump house, filter house and reservoir, foundations for water tower, steel water tower and supports, water-works intake pipe and well, sewage pumping station, sewage disposal works, bridges and viaducts.

WELLAND.—To permit the extension of the Welland town electric railway to Welland Junction to serve the factory district, arrangements have been made to build a $20,000 subway under the Michigan Central tracks. The extension is being made to accommodate the Dain Mfg. Co., which is extending its plant.

QUEBEC

MONTREAL.—The council of Verdun, a suburb of Montreal, has authorized the purchase of water mains for a number of streets.

MONTREAL.—Richard Sheet Metal Specialties, Ltd., has been incorporated to carry on business of iron and steel makers, sheet metal makers, etc.; $50,000; by Alphonse J. Lavoie, Howard Salter Ross, Oswald F. Shearer, and others, of Montreal.

MONTREAL.—Tenders will be received until June 12 for an electrically-driven, 6,000,000-imperial-gallon turbine or improved centrifugal high lift pump. Plans and specifications may be obtained from the board of commissioners, L. N. Senecal, secretary.

SASKATCHEWAN

FACTORIA.—The Hart-Parr Co., maker of gasoline and oil tractors, will shortly erect a factory here for assembling and repairs, owing to the big expansion in its business. The Saska Mfg. Co. is erecting a plant here, consisting of four buildings, 56 x 112 feet, for an assembling plant, 70 by 92 feet, for a stock room, 36 x 40 feet, for a blacksmith shop, and 18 x 18 feet for an iron store house. These buildings are already in course of construction. I. S. Houghton is the president.

REGINA.—The Grand Trunk Pacific will shortly award the contract for its two-story station in this city. This will contain all the heating, lighting, and ventilating machinery for the big hotel across the way. Refrigerating machinery will also be installed. The station will cost $400,000.

SASKATOON.—Tenders for constructing a large winter fair building will be called for shortly by the city council. Plans have been prepared by Thompson, Daniel & Colthurst, architects.

SASKATOON.—A company manufacturing a new agricultural machine in the United States has sold its rights for the three middle states to a company here, which is asking the city for help to locate. F. G. Sparling, Saskatoon, is interested.

YORKTON.—The contract for the construction of the civic power house has been let to Ritchie & Watters, for $35,557, and work will be begun at an early date.

TRADE NOTES

AUSTIN, TEX.—William B. Phillips, director of the bureau of geology of Texas, has just completed a test of 340 tons of brown ore from northeast Texas, at the Waukon plant of the Missouri Iron Co. The Goltra process is used at this plant and Director Phillips states a high class uniform product is made of ore carrying in the bank about 33 per cent of iron.

BOSTON, MASS.—The Acme Automatic Scale Co., Boston, advises it has incorporated simply to take over the business of the old company of the same name.

BUFFALO, N. Y.—The local office of the American Bridge Co. has been moved to the Marine National Bank building, Main and Seneca streets.

CINCINNATI.—All claims of the American Steel Foundry Co. have finally been settled by W. B. Melish.

CINCINNATI. — An innovation in building circles will be instituted in the new 12-story Gwynn building, which is being erected at the northeast corner of Sixth and Main streets, Cincinnati. The building will be used for office purposes but on the top floor a space has been alloted for storage and also a suite of living rooms laid out for the janitor and his family.

CLEVELAND.—The Metal Trades Superintendents' and Foremen's Club, of Cleveland, made a tour of inspection through the plant of the National Acme Mfg. Co., 7500 Stanton avenue S E., recently.

CLEVELAND. — The Frank L. Crobaugh Co., analytical chemist and metallurgist, is installed in its new laboratories and office at 1501 Columbus road N. W. This company recently took over the business and equipment of Frank L. Crobaugh, who established it in 1894. Mr. Crobaugh is president of the new company, W. C. Mason, vice president and secretary and R. M. Bundy, treasurer and manager.

DULUTH, MINN.—The Minnesota Steel Co. has increased wages of laboring men on the new steel plant from $2.25 to $2.50 a day. About 900 men are affected.

GROVE, PA.—The Imperial Co., manufacturer of brass faucets and cocks, has been reorganized and placed on a new footing. The death of J. J. Spearman, of Sharpsville, and his son, Dan Spearman, owners of practically all the stock, placed the company amid complications in the settlements of the estates, and a receivership followed. This has been terminated and a new company organized, to take over the business. Mrs. Ruth B. Spearman, president.

NEW LONDON, CONN.—The J. N. La Pointe Mfg. Co. recently made a shipment abroad of several machines manufactured by that company.

PITTSBURGH. — Haggart Bros., designing and consulting engineers, have removed their offices from the Hostetter building to the eighth floor of the Vandergrift building.

PITTSBURGH. — The Exeter Machine Works, manufacturer of elevating and conveying machinery, with office and main plant at Pittston, Pa., has opened an office at 845 Olwin building. S. C. Webb, formerly of the Diamond Machine Co., will be in charge as sales manager.

SEATTLE, WASH. — Referee in Bankruptcy John P. Hoyt, sitting as special master in the settlement of the affairs of the Washington Steel & Bolt Co., recently held invalid an issue of bonds secured by a mortgage of the company's property, amounting to $200,000.

TOLEDO, O.—The Coughlin Machy. Supply Co. has outgrown its Madison avenue quarters and has taken a five-year lease on 109-111 St. Clair street, the building formerly occupied by the Rummel Arms Co. The amount of stock carried will be greatly increased.

WARREN, PA.—Business with the Jacobson Machine Mfg. Co. is excellent, showing a gain over last year, which was a record-breaker. This concern is specializing on a portable gasoline engine for farm use and the increasing demand shows the sound basis of business among farmers, especially in the west. The Jacobson plant has been doing some business for auto manufacturers and finds in this line alone a slackness. This is due, says M. C. Kline, advertising manager, to failure of some small auto concerns which started without sufficient capital and proper designs to compete successfully.

WATERTOWN, CONN.—Work is to be started soon at the Watertown arsenal on the carriage for the 16-inch gun that is to guard the Atlantic entrance to the Panama canal. The carriage will be of the disappearing type and will cost $200,000.